

Rock Products

DEVOTED TO THE PRODUCTION
OF ROCK AND ITS PRODUCTS

Vol. VI. No. 4.

LOUISVILLE, KY., JANUARY 22, 1907.

MANUFACTURED PRODUCTS
AND CONCRETE EDITION

"NOT A SACK OF CEMENT IN THE HOUSE" You can avoid this expression and always have it to-day by reading

The American Gypsum Company's Ad On Page 91.

UNION MINING COMPANY,

Manufacturers of the Celebrated

MOUNT SAVAGE
FIRE BRICK
GOVERNMENT STANDARD.

DEVOTE a special department to the manufacture of Brick particularly adapted both physically and chemically to

**Lime Kiln and
Cement Kiln
Construction**

Large stock carried. Prompt shipments made. Write for quotations on Standard and Special shapes, to

UNION MINING CO.,
Mount Savage, Md.
CAPACITY, 60,000 PER DAY.
ESTABLISHED, 1841.

Ottawa Silica Co.'s Washed White Flint Sand

Is used for sawing stone in more than a dozen states. Cuts more and lasts longer than any other sand on the market. Unexcelled for Roofing, Facing Cement Blocks, White Plaster, etc. Freight rates and prices on application.

OTTAWA SILICA CO., . . . Ottawa, Ill.

DEXTER Portland Cement
THE NEW STANDARD

Sole Agents **SAMUEL H. FRENCH & CO.** Philadelphia



Phoenix Portland Cement UNEXCELLED FOR ALL USES.
Manufactured by
PHOENIX CEMENT CO.
NAZARETH, PA.

Sole Selling Agent **WM. G. HARTRANFT CEMENT CO.,**
Real Estate Trust Building PHILADELPHIA, PENNSYLVANIA

"RELIANCE" BELT ABSOLUTELY BEST

FOR GRIFFEN MILLS
FOR TUBE MILLS
FOR BALL MILLS

Chicago Belting Company
MAKERS

67-69 South Canal Street,

SEND US YOUR SPECIFICATIONS.

CHICAGO, ILL.

ALMA
Portland Cement

STANDARD BRAND
OF
MIDDLE WEST.

Specially Adapted to all Reinforced Concrete and High-Class Work.

Alma Cement Co.,
WELLSTON, OHIO

THIS IS AN OPPORTUNITY TO SECURE A
PROMINENT LOCATION, ASK FOR RATES.

BAGS FOR LIME AND CEMENT

We have recently purchased the factory of the Toledo Paper Bag Co. and have tripled the capacity, and are now in position to make prompt shipment of all orders with the best quality of paper. Prices quoted and samples mailed on receipt of inquiry.

The Urschel-Bates Valve Bag Co. Toledo, Ohio

**Improved Shield
Cement**

The Best Natural Cement
With 3 parts sand—425 lbs. 1 year.
Economical for Concrete.

LAWRENCE CEMENT CO.
OF PENNA.

SIEGFRIED, PA. PAMPHLET FREE.



THE SIDE WALK BRAND

MARQUETTE PORTLAND CEMENT

Gives Absolute Satisfaction for All Kinds of Concrete Work.

MARQUETTE CEMENT MANUFACTURING CO.,

MILLS: LA SALLE, ILL.

SALES DEPARTMENT: MARQUETTE BLDG., CHICAGO.



ONE GRADE—ONE BRAND.

The Recognized Standard
American Brand.

General Offices: EASTON, PA.

SALES OFFICES:

541 Wood, PITTSBURGH.
Builders Exchange, BALTIMORE.
Marquette Building, CHICAGO.

Builders Exchange, BUFFALO.
Board of Trade Bldg., BOSTON.
Park Row Bldg., NEW YORK.
Harrison Building, PHILADELPHIA.

A STANDARD PORTLAND FOR UNIVERSAL USE

PRESENT
DAILY OUTPUT
6,500 BARRELS
INCREASING
TO
17,000 BARRELS



PLANTS
AT
CHICAGO
AND
PITTSBURG

UNIVERSAL PORTLAND CEMENT Co.

CHICAGO

PITTSBURG

Buckeye Portland Cement Co.

ESTABLISHED 1888.

Manufacturers of the celebrated
"Buckeye" brand of



Portland Cement

"Buckeye" has stood the wear and tear in many
important places for the past fifteen years and
under the new process of manufacture is now
better than ever. ■ ■ ■ ■ ■

WE INVITE YOUR
CORRESPONDENCE.

Bellefontaine, Ohio.



"LIMOID"

SEWER PIPE
FIRE BRICK
PLASTER, ETC.

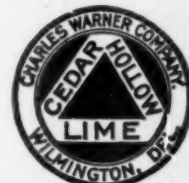


Charles Warner Company



LAND TITLE BUILDING,
PHILADELPHIA.

WILMINGTON,
DELAWARE.



HYDRATED PORTLAND LIME

IS IDEAL FOR

Waterproofing
Concrete Blocks

SAVES MONEY. TRY IT.



—FOR INFORMATION AND PRICES, WRITE—

CHICKAMAUGA CEMENT CO.,

Sole Manufacturers.

CHATTANOOGA, TENNESSEE

The Best Portland Cement Is

"LEHIGH"

MANUFACTURED BY

Lehigh Portland Cement Co.

ALLENTOWN, PA.



Write for Catalogue.

Capacity, 7,000,000 Yearly.

Chicago Portland Cement Co.



MANUFACTURER OF . . .

"CHICAGO AA"
PORTLAND CEMENT.

We make one brand only.

The best that can be made.



Manufacturers: Sales Office, Holland Building, St. Louis.

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Rock Products

DEVOTED TO THE PRODUCTION
OF ROCK AND ITS PRODUCTS

Vol. VI. No. 4.

LOUISVILLE, KY., JANUARY 22, 1907.

MANUFACTURED PRODUCTS
AND CONCRETE EDITION

ALL IN READINESS FOR THE COLUMBUS CONVENTION.

Every preparation for the eighth annual convention of the National Builders' Supply Association has been brought to completion and the able local committee, working in conjunction with the national officers and the Columbus Board of Trade, are to be congratulated upon the completion of their work.

While it is more than likely that the total attendance will not amount to more than 1,500, there will be no difficulty in taking care of 2,000 or even more than that, for Columbus is pre-eminently a convention city and it may be truthfully said that her officials and leading citizens are accustomed to taking care of large crowds, and consequently they are prepared to make things comfortable, convenient and enjoyable to every delegate who comes to the convention February 5-6-7.

Columbus, the capitol city of Ohio, is one of the most beautiful as well as the most modern of the cities of the Middle West. The public and commercial buildings would do credit to the Metropolis. The principal thoroughfare of the city, High Street, is illuminated at night by means of a succession of arches carrying incandescent globes of high candle power, causing it to present a gala appearance that has never been attempted elsewhere, at the same time so perfectly illuminating the city that night is turned into day.

Columbus is well provided with hotels, and the arrangements for the accommodation of the delegates to the Builders' Supply Convention are all that could be desired. The official headquarters of the association will be located in the Southern Hotel, which is a leading first-class American plan house, where all the meetings of the convention will be held, as well as the social functions. Arrangements have been made for rates with the Hartman Hotel, which is operated exclusively upon the European plan, and situated almost adjacent to the Southern, one block distant on the same street, and quite as near to the entrance of the Southern Theatre, which is a part of the Southern Hotel building. The rates of both these hotels are in keeping with the accommodations, which are first class in every particular such as the dealers have been accustomed to in the conventions of the past.

A number of the leading manufacturers will be represented at this convention, as usual, and the dealer will have every opportunity of coming in touch with his brother dealer and the man who manufactures the product that he sells. Undoubtedly the information gathered at this convention will be well worth the expense to every dealer who attends the great Columbus convention.

The Columbus dealers have a local organization of which Frank Hunter, of the Columbus Contractors' Supply Co. is the president, and of which every dealer in the city is a member. This local organization of builders' supply dealers, acting in

conjunction with the executive committee of the National Builders' Supply Association, have selected R. Stanley Rhoads, of the American Sewer Pipe Co., as chairman of the local committee of arrangements and entertainment. They could not have made a better selection, for Mr. Rhoads has surrounded himself with the most energetic and enterprising members of the local organization, and this committee working as a unit, have accomplished the most perfect preparation for this annual convention. Their duties are by no means closed, for the Columbus local committee will be on hand to a man throughout the period of the convention to look after the entertainment feature and to keep the Columbus welcome always in evidence.

In order that the reader may recognize our Columbus hosts, upon another page we give a fine group picture of the whole committee, with their names attached, so that you will have no difficulty whatever in recognizing any one of them



SOUTHERN HOTEL, COLUMBUS, O., WHERE THE BUILDERS' SUPPLY MEN WILL MEET.

with whom you may not be already personally acquainted.

Mr. R. Stanley Rhoads, the head of the Columbus branch of the American Sewer Pipe Co., was born in Columbus about 35 years ago, and began his business career as the secretary of the old Columbus Sewer Pipe Co. He is a representative of the young business man, the feature of Columbus commercial enterprises that has placed the city in her present leading position. Besides sewer pipe, he handles a full line of supplies and his enormous sales of Portland cement last year were a feature of his operations. Outside of his business engagements, Mr. Rhoads enjoys nothing so much as his gun, and he has made a record of duck shooting and knows what it is to stalk big

game. He has an orange grove in far-away Florida and on occasions he has been known to catch a tarpon in the rivers that empty into the Gulf of Mexico. There is no more popular man in Columbus, for he is a natural born worker, to bring to success everything he undertakes.

Mr. Frank Hunter, general manager of the Columbus Contractors' Supply Co., is a native of Lincoln county, Ohio, but lived at the beautiful town of Sidney and for several years was a public official and postmaster of that city. He came to Columbus in 1902 and organized the company of which he is the general manager. This company is the exclusive sales agent of the famous "Franklin" face brick, manufactured by the Franklin Brick Co., at Taylor Station, eight miles east of the city. The deep, blood red brick to be seen in so many of the handsome buildings of Columbus, are the best evidence that Mr. Hunter's hobby is well taken and the faith in his favorite is well founded. Mr. Hunter is an energetic fellow, with a big heart and a broad mind, and as president of the local supply dealers' organization, has succeeded in getting every firm operating in the city to join that body. He says that his firm recorded the largest business in their history in 1906 and they are making arrangements to take care of even a larger volume of trade in the year just opening.

Mr. J. F. Angell is vice president and treasurer of the United Cement Machinery Manufacturing Co., of Columbus, a concern which represents the consolidation of three of the leading establishments whose promotion of the cement industry as a building material, has gained prominent notice in the last few years. Mr. Angell is a native of Ohio and previous to entering the machinery line, he was a railroad man for a period of upwards of thirty years and followed the development of the railroad systems of his native state, having served as superintendent of the Ohio Central and other connections. He has made his home in Columbus since 1901 and has been prominently identified with the development of the city in the important branch of the manufacturing of machinery.

Mr. Charles Frank, of the Columbus Coal and Lime Co., is the native of Wurtenburg, and represents a highly esteemed firm of supply dealers. He is a Teuton from that sturdy stock that has done so much to develop the great State of Ohio. He came to Columbus in 1857 when a mere youth. Being a cabinet maker by trade, he readily found employment. He organized the present company about two years ago in conjunction with Mr. Carl H. Niermeyer, although they have been identified with the supply business for more than twenty years. They handle a full line of builders' supplies.
(Continued on Page 63.)

The O'Laughlin Revolving Screen

For Granite, Stone, Sand, Gravel, Coal, Coke or anything requiring separation.

THE principle of separating is exactly opposite that of the older style revolving screen, the materials being discharged on coarse perforations first. The coarse material is immediately separated from the finer in each of the concentric screens to the different required sizes.

The type of screen here illustrated is in use at a No. 8 Crushing plant for limestone (which was formerly equipped with three of the older style screens and required an outlay of \$350.00 for each 100,000 cu. yds. of stone separated. Up to the present time it has made perfect separation into five sizes of 300,000 cu. yds. with a recent outlay of \$27.00 for renewing the portion of the screen that the stone has been discharged on, and should do as much more without any additional outlay.

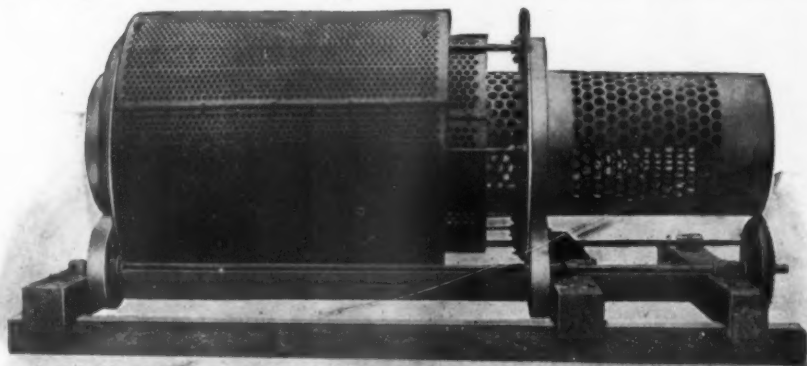
The inside or longest screen is 8 feet long and 36 inches in diameter, the next concentric screen is 7 feet 6 inches long and 48 inches in diameter, the next screen is 7 feet long and 58 inches in diameter, the next is 6 feet 6 inches long and 66 inches in diameter. With the exception of the inner screen each section is adjustable and the screen is complete without it. The figures given above give 492 sq. ft. of

screen surface which is equal to 3 screens of the old pattern, 14 feet long and 36 inches in diameter.

We claim it requires but one-fifth the power to operate our screen than the old style and yet it does the same amount of work. This is proven first, by the length of screen; second, by the size of driving pinion in comparison with gear; third, by the size of trunnions in comparison to the tread of screen. The material to be sep-

arated and weight of screen rests above the bearing points. While in the old style screen it is below the center of bearing points. The material being immediately separated by dropping into each of the concentric screens reducing the wear on screens to the minimum.

Let us know your requirements, what materials you wish separated, the amount daily and the different sizes, and we will furnish an estimate as to cost, power required, etc.



JOHN O'LAUGHLIN, - - - RACINE, WIS.



**Strength
Durability
Permanence**

Not only laboratory tests, but results in actual work prove the high grade quality of

**Northampton
Portland Cement**

Especially adapted for Cement Blocks, Sidewalks, and all forms of concrete and re-inforced concrete construction.

Northampton Portland Cement Co.

No. 1 Madison Ave., NEW YORK.

Works at Stockeown, Pa.

Use Louisville Hydraulic Cement for Foundations

and invest the amount saved thereby otherwise. Concrete made of Louisville Cement is strong enough for foundations of all kinds, and by the use of it a great saving is effected. The following letter from a well-known firm of Chicago architects, written when Louisville Cement was not ground so fine as it is to-day, shows its good quality and suitability for foundations:

CHICAGO, ILL., Sept 29, 1898.

Mr. A. L. Kanagy, care of Western Cement Co., Louisville.

Dear Sir: In reply to your question concerning the concrete foundations of power house of the South Side Elevated Ry. Co., at 40th and State Sts., Chicago, which foundations were made of Louisville Cement, we beg to say that the foundations have turned out to be perfectly satisfactory, and behaved all the time as we expected they would.

The controversy which arose at one time concerning this was caused by no fault of the concrete or of the cement.

It is true that one of the engines was wrecked and twisted off the foundation bolts without doing any injury to the foundation.

Yours very truly, D. H. BURNHAM & Co.

Louisville Cement mortar made in the proportion of 1 cement to 2 sand, will develop a tensile strength of over 100 pounds per inch in seven days, and will withstand a crushing strength of over 1,000 pounds per inch in twenty-eight days.

Louisville Cement in bags of 4.77 cubic feet per barrel, costs less than 50c per barrel at the mills. At this price a simple calculation will show the economy of its use. Write for pamphlets and test sheets.

WESTERN CEMENT CO.

INCORPORATED.

281 West Main Street,

Louisville, Kentucky

Reputation Unrivalled

ONE BRAND ONLY
Sound, Strong, Uniform



ONE OF THE OLDEST AND THE BEST.

Vulcanite Portland Cement Co.

Flatiron Bldg., New York. Land Title Bldg., Philadelphia.

THE TIES THAT BIND

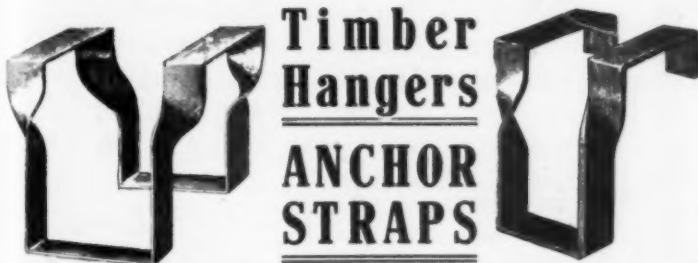
a brick wall *Better* than any on the market are the *Leader and Acme* Wall Ties for solid or veneer walls. Manufactured by

Specialty Manufacturing Co.

1221 Grant Avenue,

WRITE FOR PRICES.

ALLEGHANY, PA.



**Timber
Hangers**
**ANCHOR
STRAPS**

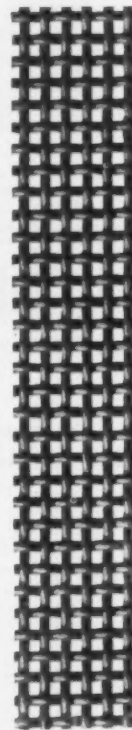
For Wood, Steel or Concrete Construction. Special Hangers to suit any conditions.

CHAS. MULVEY MFG. CO.

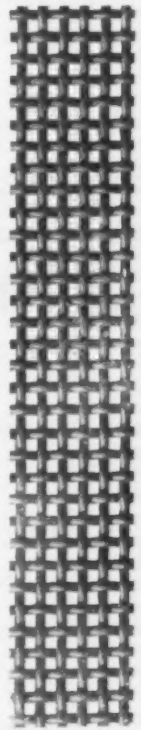
17 to 21 South Jefferson Street, :: CHICAGO, ILL.



Reduce Your Screen Expenditure



We want you to know why "Tyler" Double Crimped Screens have such extraordinary long life; why the meshes are all uniform and accurate even when the wires are almost worn away and why we can guarantee to reduce your screen expenditure. This is all made clear in our interesting book on "Screens," which is also complete in technical information. Put your name and address on the coupon below and mail it to us.



The W. S. Tyler Company

Manufacturers of Wire Cloth from 4-inch Mesh to 200 Mesh.

CLEVELAND, OHIO.

TEAR OFF HERE.

THE W. S. TYLER COMPANY, Cleveland, Ohio.

Please send free of all expense your new book on "Screens."

Mark for Mr. _____

Name of Company _____

Address _____

Dept. "R. P."

OWL CEMENT

is not the only Portland Cement,
but one of the best manufactured.
Pamphlet sent on application.

GERMAN-AMERICAN PORTLAND CEMENT WORKS,

E. L. COX, General Sales Agent,
1511 Marquette Building, Chicago, Illinois.

Members Illinois Lumber Dealers Association.

WE SELL TO DEALERS ONLY

BANNER CEMENT CO.,

MAKERS OF THE FAMOUS BANNER BRAND OF
LOUISVILLE CEMENT.

Guaranteed that 90 per cent. will pass a
ten thousand Mesh Sieve.

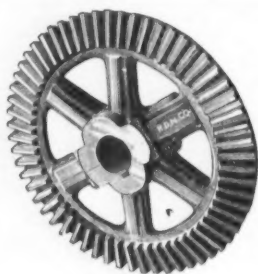
WE SELL TO DEALERS ONLY.

GENERAL OFFICE: MASONIC TEMPLE, CHICAGO, ILL.

Newaygo Portland Cement Co.

Sales Office: Michigan Trust Building,
GRAND RAPIDS, MICH.

Write us for prices. Send us your orders



Our Gears

are cut not cast, a feature which is
evidently appreciated by eminent man-
ufacturers, judging by the ever increas-
ing volume of orders they are sending
us.

Write for our booklet, telling all about Gears.

R. D. NUTTALL CO.
PITTSBURG, PA.

Improved Utica Hydraulic Cement

The finest ground and highest grade Natural Cement manufac-
tured in the U. S. Every car tested by Robt. W. Hunt & Co., and
their test furnished on every car shipped.

MEACHAM & WRIGHT CO. Sole Agents, Chicago.

CHARLES W. GOETZ LIME & CEMENT CO.

MANUFACTURERS OF AND DEALERS IN

Glenwood Lime, Banner
Brand Louisville Cement,
Portland Cements and
Building Materials.

St. Louis, Mo.

AUTOMATIC ELEVATOR

Capacity, 1,500 Tons a Day.

The ten cars shown in cut were loaded in four hours.
Separates sand from gravel as it is loaded on cars.

SHOEMAKER & CASPARIS,
NEWCOMERSTOWN, OHIO.

Write for Prices and Descriptive Catalogue.



JEFFREY

? THE IMPORTANT QUESTION

A RELIABLE PAPER BAG

THAT will stand severe handling,
and arrive at destination with-
out damaged contents, has been the
one desire of the cement and hydrated
lime manufacturer. We have solved
the problem and can convince you
with the first order.

The West Jersey Paper Mfg. Co.

Front and Elm Streets

CAMDEN, N. J.

Tell 'em you saw it in ROCK PRODUCTS.



The Standard American Brand

ALWAYS UNIFORM

Dealers who handle

ATLAS PORTLAND CEMENT

find their trade constantly
increasing with the most
desirable Contractors

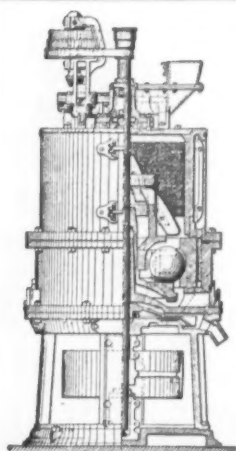
OUTPUT FOR 1907 OVER 13,500,000 BARRELS



The Atlas Portland Cement Company

30 Broad Street NEW YORK





Fuller-Lehigh Pulverizer Mill

The Best Pulverizing Mill Manufactured

Exhaustive tests in all departments, in competition with the most approved grinding machines in use, have demonstrated the superiority of our machine

OUR CLAIMS:

Greater Output

Better Fineness

Fewer Repairs

Dustless

Few extracts from letters received from users:

"With the four we are now ordering we will have in use 16 Fuller Mills in all, and I think you can hope to get orders from us within the very near future for quite as many more."

"We have to say for your Fuller Mill that it is unqualifiedly the best grinding device we have ever tried on our lime rock and eminently satisfactory to us."

"We are pulverizing with one Ball Mill and four Fuller Mills sufficient raw material to produce nearly 1200 barrels of clinkers per day, which record I believe can not be approached by any other mill on the market."

If interested, write us for further information

LEHIGH CAR, WHEEL & AXLE WORKS, CATASAUQUA, PA. U. S. A.

STURTEVANT GRINDING MILLS

SIX KINDS

FOR

Hard, Soft or Medium Rock.
Produce a finished product
without screens.

SEND FOR CATALOGUE

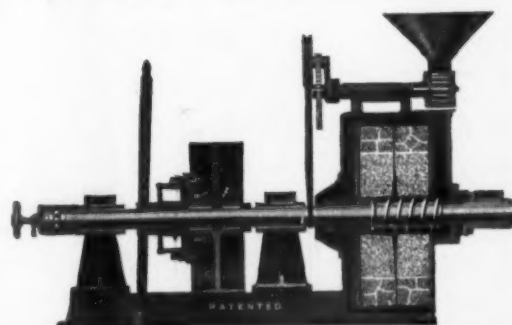
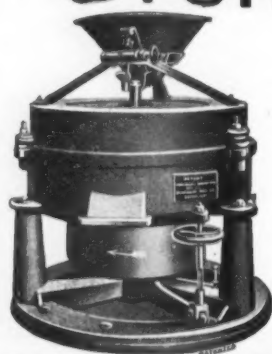
OF

ROCK AND ORE REDUCING MACHINERY.

STURTEVANT MILL COMPANY

105 CLAYTON STREET.

BOSTON, MASS.



Do You Grind Paints or Pigments?

Do you use the Raymond System of Pulverization and Air Separation? Would you use it if you knew it would **SAVE YOU MONEY** and **INCREASE YOUR EARNINGS**? Write to any of the following satisfied customers:

NATIONAL LEAD CO., Chicago: We are very glad to say that the Raymond Pulverizer, which we have used in our oxide works for several years past, has done its work with perfect satisfaction, and we consider it the best machine for that purpose that we know anything of. It gives a very uniform and regular product in the way of fineness, and does not get out of order easily, being very reliable in its working in every respect.

WESTERN DRY COLOR CO., Chicago: In the three years we have used your mills they have worked to our satisfaction, turning out a uniform fine product and requiring but few repairs.

THE IOWA PAINT MFG. CO., Fort Dodge, Ia. We have used one of your cyclone mills for eleven years, and we highly recommend it after that long service for first class pulverizing work. Your machinery needs but little attention and if it has a fair show it will give perfect satisfaction.

CARTER WHITE LEAD WORKS, Chicago: We have used your Separator for separating out tailings from the red lead and litharge with satisfactory results.

WARREN BROTHERS CO., Boston, Mass. We have been using your mill at our refinery a great deal in the last three years and during the past six months have been grinding magnesite with it, getting 75% passing 200 mesh screen. This latter material we were unable to grind to this fineness with any other mill.

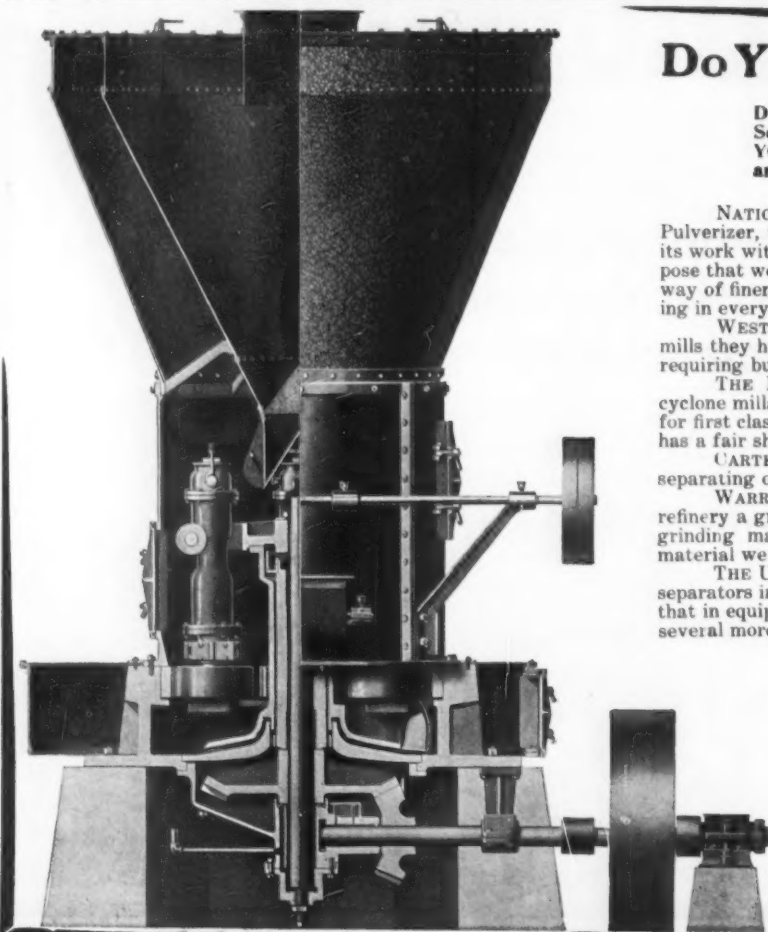
THE UNITED STATES GRAPHITE CO., Saginaw, Mich. We have used your separators in our plant here at Saginaw upwards of ten years with such satisfaction that in equipping the new plant which we moved into only a year ago, we installed several more of them.

These are a few out of the many, all highly satisfied users of the **RAYMOND SYSTEM**. How would you like to travel in their care-free class?

**Raymond Bros. Impact
Pulverizer Co.**

141 Laflin Street,

CHICAGO



Economy Dictates

that the jaw-plates, cheek-plates, cones and concaves of your crushers should be made of

"Taylor-Made" MANGANESE STEEL "Taylor-Made"



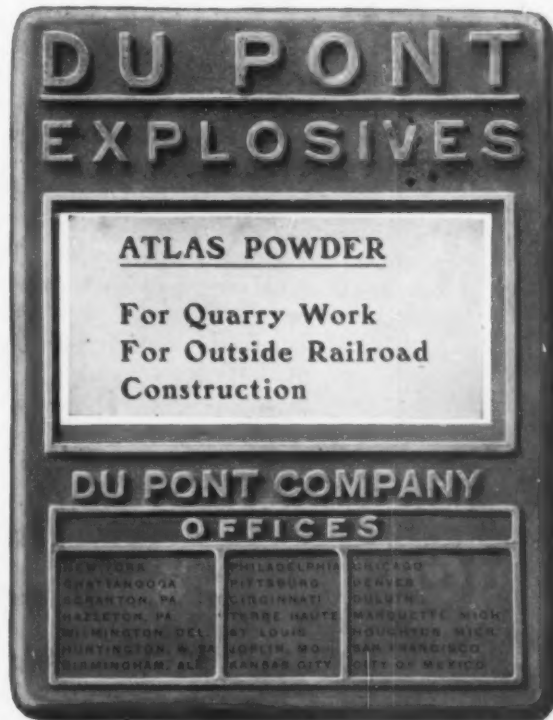
The actual ratio of wear in "Taylor-Made" plates, as compared with other castings, has been proved by large users in hundreds of cases to warrant their use.

"THE REASON'S IN THE STEEL."

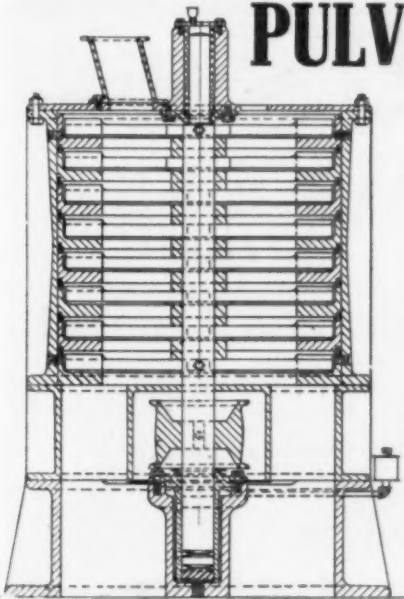
We shall be pleased to give you further information.

Taylor Iron & Steel Co.

HIGH BRIDGE, N. J.



PULVERATORS



The accompanying cut shows our No. 4 PULVERATOR which was designed to reach the largest scope of what is required in the grinding of any kind of material from Glue and Bones to ROCKS of any kind.

This mill will take in pieces as large as a man's fist and can be regulated to

grind the same to granulations or to a powder.

It is certainly the best "ALL-AROUND" mill in the market.

Please write for further information and our latest illustrated catalogue.

J. R. ALSING CO, Engineers and Manufacturers

Main Office; 136 Liberty Street.

NEW YORK

WORKS AT

KOPPEL

COMPLETE BEAVER COUNTY, PA. INDUSTRIAL

TRADE MARK.

Railway Equipments

For the Clay Worker, Brickmaker, Cement Worker, Mines and Quarries.

Write for Catalog No. 37

IN STOCK

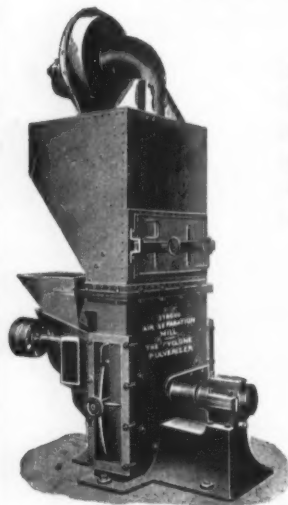
Rails, Steel Ties, Portable Track, Switches, Frogs, Crossings, Steel Dump Cars, Flat Cars, Turntables, etc.

ARTHUR KOPPEL COMPANY

66-68 Broad Street, New York. 1639 Monadnock Block, Chicago.
 53 Oliver Street, Boston. Machesney Bldg., Pittsburg, Pa.
 515 Market Street, San Francisco.

The
STROUD MILLS
 OUTDO ALL OTHERS

In quality of grinding and in output per horse-power per hour on most kinds of work, and they grind for less money per ton.



Our Air Separation Pulverizers produce direct from mill, any desired mesh, from say 40x40 down to the most impalpable powders, at will of operator, at a moment's notice. Dustless in operation.

Do away with sieving entirely.

We build Screen Separation Mills too.

Catalogue on request.

E. H. STROUD & CO.

ENGINEERS & MANUFACTURERS
 30-36 LaSalle Street, CHICAGO, U. S. A.

**We Manufacture and Erect
 Complete Gypsum
 Plants**

Of small or large capacities, for making Plaster of Paris or Stucco. We also build complete ready mixed Plaster Plants.

The C. O. Bartlett & Snow Co.
 CLEVELAND, OHIO

PATENTS

C. L. PARKER,

Attorney-at-Law and Solicitor of Patents

146 Deitz Bldg., Washington, D. C.

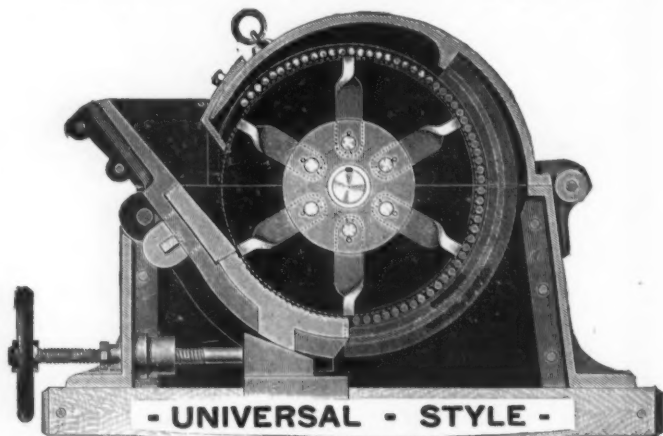
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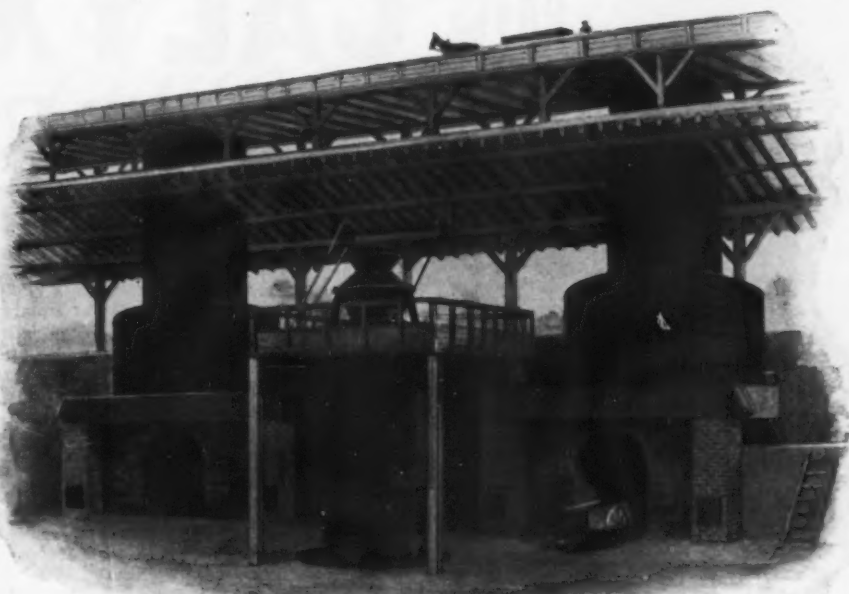
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Gas Producer Plant of the New England Lime Co., New Milford, Connecticut.

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It increases the
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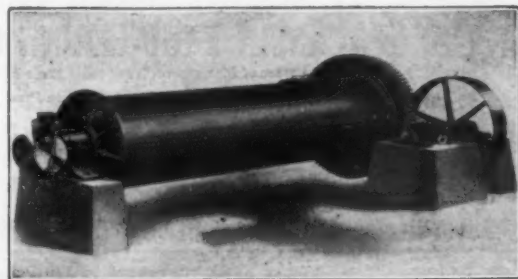
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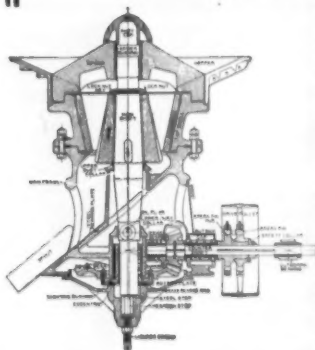
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THE AUSTIN GYRATORY CRUSHER IS THE ONLY ONE HAVING AN AUTOMATIC OILING SYSTEM.



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An automatic pump draws pure oil from this cellar, forces it through the eccentric and counter shaft bearings and any oil thrown from the teeth of the driving gear is caught by the cap and carried back to the cellar.

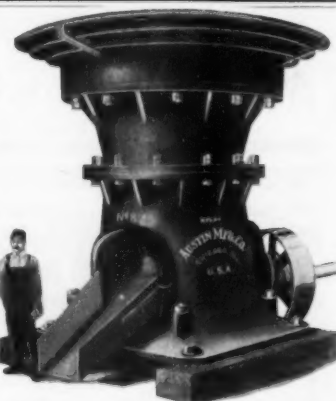
At the bottom of the cellar is a drain by means of which the impure oil can be removed insuring absolutely perfect lubrication because every part of the bearings operates continuously in a bath of pure oil.

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Here's the Way: Get some Good printed matter—Circulars, Blotters, Catalogues—and send to a selected list of possibilities. Then do it again. Then do it again and keep it up. It will pay if the printing is right—that's where we come in. We print anything from a visiting card to a 100-page newspaper. Also ruled forms, blanks, blank books, loose-leaf sheets and index cards.

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Take Time by the Forelock

Get a Kritzer Continuous Hydrator

If you want to do a rousing lime business in the spring, you've got to begin to get ready for it NOW. Get your plant up and get busy hydrating. Let the people know you mean business, and that you've got the stuff to sell. Spread the news all about you everywhere. Let the builders and everybody who uses lime know how much better hydrated lime is than the old-fashioned kind. Show them how much more convenient hydrated lime is to handle, how much easier it is to work and how much more economical it is. Do you know that plaster and mortar from hydrated lime gains increasing strength with age? Well, it does. The older it gets, the stronger it is.

Hydrated lime can be used in more ways than lump lime can. You can sell much more hydrated lime than you ever could of the other kind, and there's no chance for loss on it. It don't air slack. It don't swell and burst the bag. As little or as much may be used as needed, and the rest will keep good for years.

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We are makers of machinery for hydrating lime. We will furnish you anything from a sprocket wheel to a complete plant, and guarantee whatever you get from us to be the best of its kind in the country. We have the most up-to-date and successful method. Our machinery is tried and tested, and we've had more real experience in this business than all our competitors put together. That's a broad statement, eh? Well, We Can Prove It.

You can't afford to wait. Write Us Now.

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This is the Mill that (Clyde) built.

expressly
to hydrate
samples of your
lime, so as to dem-
onstrate what we can
do with it.

¶ Possibly you can't arrange to visit our plant in person, but anyway ship us, say 10 barrels or so of your lime, so we can show you just what kind of hydrate it will make. We will return as much of the finished product as you want. Then have your mechanics try it for working qualities. It will cost you nothing but — the freight.

¶ As shipments are continually arriving, we would urge you to get yours on its way, so it can get back to you before building time.

¶ Our plant is open at all times to interested parties. Come, or send your lime, or both.

Write us "We like to answer questions."

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STRONGEST IN OHIO.

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Excelsior Hydrated Lime

A PRODUCT OF MERIT.

The best prepared Lime in the market. Is superior to hot Lime for all purposes. Will not deteriorate. Absolutely pure and free from foreign ingredients. Successfully used for more than two years by the largest users of Hydrate in the country.

SEND FOR PRICES.

MADE ONLY BY

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Try us on your Portland Cement requirements

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The **Strongest White Lime**

ON THE MARKET

Uniform Quality

Finest Grain

The American Clay Machinery Co.
WILLOUGHBY, OHIO

May 16, 1906.

The Mitchell Lime Co.,
Mitchell, Ind.

Dear Sirs:-

Replying further to your favor of the 8th inst requesting us to advise you the result of practical test of your lime in the manufacture of sand-lime brick. We are pleased to advise you that the lime hydrated easily and the brick made from it were first-class in every respect.

We have forwarded some samples of it to Mr. Elkus of the Indianapolis Composite Brick Co. and he can probably advise you further.

Very truly yours,

The American Clay Machinery Co.
by W. J. Burke.

MITCHELL LIME COMPANY
MITCHELL, INDIANA

WESTERN LIME CO.

HUNTINGTON, INDIANA

MANUFACTURERS OF

LUMP LIME

ALSO, DIAMOND BRAND SUPERIOR WHITE FINISH

A HYDRATED LIME

AND A GROUND AND FERTILIZER LIME

Capacity 4,000 barrels or 10,000 bushels per day. Capacity of Hydrated Lime, 120 tons per day. Our LUMP LIME as well as our HYDRATED LIME is the very best obtainable for all purposes for which a good lime is needed in erecting buildings. Our HYDRATED LIME is absolutely the best finishing lime on the market.

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KANSAS CITY, MISSOURI.

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ITS HISTORY IS A STORY OF SUCCESS.

The Building Trades' Barometer. The Iron and Steel industry promises increased activity. It is predicted that a new tonnage record in that business will be established.

This means a large demand for LIME, and transportation facilities taxed. Isn't it wise to arrange early for your supply of LIME?

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Celebrated "Cheshire" Finishing Lime.

Well known throughout New York and the Eastern States as the finest finishing lime manufactured. The special feature of this lime is its quick and even slacking, thus preventing any cracking or checking when put on the wall. It is the best lime used in the country today for all

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Lime Kilns and Complete Lime Plants

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Modern Grinding Machinery

KOMINUTERS for granulating
TUBEMILLS for pulverizing

Davidson Tubemill especially
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Brick Work.

Silex Linings for Tubemills
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Catalogue No. 28.

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95 Liberty St., New York City
Woodward, Wight & Co., Ltd., New Orleans, La.

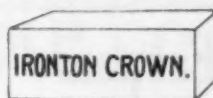
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COLORING

OF ALL SHADES.

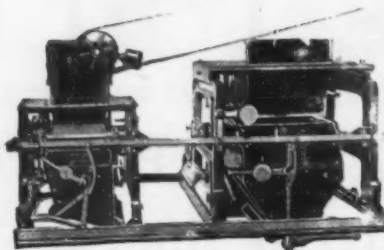
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CAN NOT



The Richardson weighs accurately, proportions of Sand, Lime, Brick, Color and any other materials.

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Entered as second-class matter December 16, 1906, at the Post Office at Louisville, Ky., under Act of Congress of March 3, 1879.

THE FRANCIS PUBLISHING COMPANY,
Publishers.

E. H. DEFEBAGH..... President.

A semi-monthly trade journal devoted to the interests of the manufacturers and dealers in rock products and kindred lines, including Lime, Cement, Salt, Sand, Slate, Granite, Marble, Sandstones, Grindstones, Artificial Stone, Emery Stone, Quarries, Monuments, Manganese, Asphalt, Phosphates, Plaster, Terra Cotta, Roofing and Roofing Tile, Coal, Oil, Mineral Wool, Brick, etc.

EDITORS.

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ASSOCIATE EDITORS.

HENRY C. WHITAKER.....Barre, Vt.

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Regular Staff Correspondents in the Principal Centers.

The mission of ROCK PRODUCTS is to serve the trade in any and every honorable way possible, to promote better profits and make life more pleasant for those engaged in the business to which it caters. With this end in view, criticism is courted, and all are invited to use its columns to further ideas and suggestions for the good of the trade. The office, too, is at the service of the constituents of this paper; so when you want to buy or sell, or merely ask a question, write, and when you are in town, call and make it your headquarters.

"TELL 'EM YOU SAW IT IN ROCK PRODUCTS."

No contracts will be accepted with advertising agencies, as our system for promoting the interests of patrons requires direct co-operation.

Matter for publication to insure insertion in any given number must reach this office at least ten days preceding the date of the paper. This measure is made necessary by the rapid growth of circulation, taking more time in the printing department.

SUBSCRIPTION RATES, \$2.00 per annum, postpaid anywhere in the United States, Canada or Mexico; \$3.00 elsewhere in the Postal Union. Single copies, 10 cents.

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NEW ENGLAND OFFICE—16 Merchant St., Barre, Vt.

LOUISVILLE, KY., JAN. 22, 1907

We invite you to visit the Greater Louisville Exposition, March 18-30.

To Rock Crusher Men.

THE rock crusher man has learned more about his own business in the last two years than there was to be learned before that time. A mighty reorganization of this industry is in order, which means more and larger plants located not only with reference to the supply of stone, but that much more difficult proposition of transportation facilities. The stone crushing plant of the future will be a much larger institution than it has been considered, and the separation of the product from the dust and fine screenings and the macadam or ballast sizes will be a feature of growing importance, for the fine screenings are now worth more money than anything else produced by the crusher. The crusher man who does not read the signs of the times in ROCK PRODUCTS regularly is the fellow who is likely to lose out by finding himself operating an obsolete plant with the main sources of modern revenue cut off. We hear of more people equipping their sand banks or sand pits as the owners of such properties wake up to the opportunities we are constantly hammering at them. There is absolutely no limit to the consumption of sand which is properly separated, screened and washed upon a commercial basis. It is really the most attractive field for investment where the supply and the market are close enough together.

A Normal, Steady Growth.

THE sooner we shake off the idea that the building season of 1906 was a phenomenal one the better it will be for us. True, the sales of every classification of building material exceeded anything that had ever been recorded in the past and all manufacturers were able to dispose of the full output of their plants. Now, look the field over and consider the enormous growth of the population of this country, especially in the larger cities where the consumption of building materials has been most pronounced and the natural commercial expansion created by the universal adoption of modern inventions directed at the personal comfort of our ever increasing population, and the basic principle of expansion at once becomes apparent. We must realize that this great nation of nearly a hundred million prosperous citizens has not, up to this time, known personal and commercial comforts, such as their inclination and means entitle them to, so that we are now merely working up to the normal, and while we are setting the pace to the older countries they are really no criterion, for none of them for centuries has had the natural resources to develop to furnish the encouragement for inventive genius to cater to the finer conveniences of civilization.

Let us wake up and realize that the active season of 1906 has been our first normal year, as far as building operations are concerned, for the future certainly promises yet larger and more costly investments in the building line than we have seen in the past, and to this statement 1906 is no more of an exception than any other past year. Every manufacturer and every dealer who experienced a record-breaking season must prepare for similar and greater things in the present year and in the years that are to come. The much talked of expansion is merely the natural commercial growth of a nation of people who are increasing both in population and wealth by leaps and bounds and made necessary and indispensable to accommodate the consequent expansion of every kind of commercial activity.

Learning About the Railroads.

THE Reciprocal Demurrage Congress recently held at Chicago, is proving to have an enormous value from an educational standpoint. One bit of intelligence established beyond peradventure is worth the entire expense and labor of such a convention. The management of the railroads of this country, with one or two conspicuous exceptions, has been found to be in inefficient hands and most miserably administered. The entire operation of important arteries of traffic is relegated to department chiefs who are themselves capable enough and equipped with the necessary knowledge of the railroad business from practical experience to achieve wonderful improvements if they had a free hand, but these able men lack authority and are forced to take orders from the mis-called "masters of finance" who imagine themselves railroad experts because they have become magnates in the stock markets. Our liberal government and our over-liberal people have subsidized and winked at irregularities, and even assisted to an enormous extent in providing the investment necessary to construct railroad properties, and they have even allowed the capitalization of the probabilities of development of natural resources within the circle of influence of railroad operation.

The commanding prerogative has been used to keep the transportation facilities up to date or abreast with the development of manufacturing and commercial interests of the country. With road beds, bridges and terminals completed twenty years or more ago, and with rolling stock and mo-

tive power quite as obsolete, they say to the enterprising and aggressive manufacturer and merchant, "Be content." They show their inefficiency because they have not realized and provided in advance for the steady growth of the transportation business of the country. They refuse to see that the long distance trolley service indicates a multiplication of the demand for transportation accommodation upon a yet much larger scale. Their minds are not large enough to conceive that the growth of American commerce and manufactures is an irresistible torrent that can not be checked and held back by their narrow rulings and insignificant appropriation for improvements. They will be forced to be up and doing early and late or these incompetents will be swallowed up in the wave of progress and others more worthy and better equipped will give this country the transportation facilities which they demand without equivocation and with the price to pay.

BUILDERS' Supply Dealers, On to Columbus!

WHEN the rainy season is on the roofer gets busy with his repair department.

THE building season of 1907 is full of promise to every manufacturer of materials. Let us get together and realize.

THE machinery exhibitors at the Cement Users' Convention at Chicago, one and all express themselves as highly gratified with the results.

The concrete contractor is now lining up his organization for another active season upon a larger scale. His operations grow with each succeeding calendar year.

THE difference between a growing and profitable business and one upon the ragged edge of failure is accounted for by the sales that were overlooked which ought to have been made day by day.

ARE you getting the full benefit from your trade paper by reading every line of it from cover to cover? If not you should begin with the January number. There is scarcely a page of ROCK PRODUCTS that does not contain the suggestion of an opportunity which, over-looked or wasted, may never return again.

LET every dealer in builders' supplies as soon as he has read ROCK PRODUCTS from cover to cover proceed at once to purchase his ticket to attend the eighth annual convention of the National Builders' Supply Association. It is worth the money and you lose more than it costs if you do not go.

HYDRATED lime is constantly growing in favor both with the dealer, who finds there is no waste in keeping it for a long period of time, and the consumer who appreciates the facilities and economies with which it can be used. It is not strange that a money-maker, from every standpoint, should become popular in these times.

THE Information Bureau of ROCK PRODUCTS is wide open, free of charge, to every interested party. It is impossible for us to print in every issue all that we have on any given subject. We will gladly pass the information that you request, either privately or through the paper from a well nigh exhaustless fund of direct personal testimony.

If you are troubled with car shortage have you done your part by writing to your Congressman to give his influence and vote for the improvement of our internal waterways? When the waterways are what they should be the congested railroad traffic can be efficiently relieved, and not before. This means putting money directly into your pocket. If you have not written do it now and see that others equally interested do likewise.

Editorial Chat

The Cement Situation.

In looking over the ground with a big cement manufacturer during the past two weeks, we have discovered that never in the history of the business was there so much activity with the buyer at this time of the year. The manufacturer generally has had to refuse to sell cement for a longer period than ninety days. There has been little cement sold for delivery in four or five months, but it is only in special cases and then after much persuasion on the part of the dealer; while it is true that by fall there will be quite an increased capacity over last year of Portland cement because most of the large manufacturers are adding to their equipment and several new mills will break into the trade. If there is anything like the increase in consumption there was last year there is no reason to believe there will be any over-production. However, when you are making over 1,000 barrels a day you can only carry so much in the stock house and you want to take care of your customer, so the manufacturer is inclined to sell on the present basis a certain percentage of his production, but the days for the long-winded contract covering a period have gone by, notwithstanding the fact that we hear of one or two cases that were a bad thing for the cement trade.

The Smart Salesman.

We walked in on a cement manufacturer the other day. He sells more goods than anybody; never has enough to supply his trade; has more orders than he can take care of, and yet we discovered on the same morning that he had made contracts in an Eastern city on a basis of \$1.40 throughout the year. Now, we do not consider him such a crack salesman. He has a good brand and his cement is all right, but when he has got to tie himself up in a contract for a year, notwithstanding the market may go up to \$2.00 in the last half of the year, I believe there are salesmen who know better how to get rid of their product than he does. The majority of the aggressive men in the trade, men who are in touch with every section of their territory, are not worrying about orders. When their customer comes along and wants so many barrels delivered in January, February and March they book him at \$1.05 or \$1.10 f. o. d. the mill, but they don't go and tie themselves up on a contract because they feel that the market price will advance, but should the price drop to 95 cents at the mill in July, August and September and they will have to satisfy their customer in some way or he will cancel the order. Of course that is the wrong thing for the dealer to do, but it has been done for so long that it looks like some people never get out of it.

Now, the influence of a man contracting when everybody else is only agreeing to sell for delivery within three months is to play into the hands of the buyer. Of course we don't take one side or the other, but we do think with a stable market, whether it be \$1.00 at the mill or \$1.10 at the mill, will not hurt the dealer any, but we know it does hurt the dealer when he is tied up with a contract when the price goes down and he has to take the stuff, and it hurts much worse for the manufacturer when he has sold his production for the year and the price advances 25 cents a barrel. Now, then, if the gentlemen most interested, the manufacturer and the dealer, could get together and decide on what is fair to both they would discover that the staple market would make both the most money, and the consumer would pay the bill.

Do You Make Your Own Policy?

We had a conversation the other day with a cement manufacturer who stated two cases which indicate to Rock Products that he was conducting his own business. One case was particularly aggravating in that the customer had accepted the terms and the specifications outlined by the cement manufacturer for 9,000 barrels of cement to

be delivered in a certain period and he used 16,000 and then claimed that other terms were made and asked the manufacturer to pay for a loss by him of \$3,300.00 because he had to pay the higher price, and, strange to say, the manufacturer paid it. We wish Rock Products could get money that easily, but the manufacturer insisted that they did not want to do business with the dealer any more, and rightly so, for it was not the manufacturer's fault that the dealer had made an open specification to the contractor agreeing to deliver all the cement used on the job and then only purchased from the manufacturer one-half of the amount and the price went up and he was in a hole.

Another case in point was that the customer refused to take a general sales agent's word for the fact that he would not contract to deliver in advance for a whole year at a certain price because he did not know what the market would be in July or December, and wished to protect his own company against loss from advances which were probably likely to occur. This dealer was also cut off the list and he finally, after a good deal of correspondence, accepted the inevitable and agreed that the manufacturer's sales agent was only doing what was right and proper for his own institution, and all was lovely.

These little things come up all the time and could be avoided if all dealers as well as manufacturers wanted to do the right thing and would cut out the speculative feature of the business.

The Speculative Contractor.

One of the good and evil factors in the building material business in the past two years has been the speculative builder. In the large cities everywhere you can see his footprints occasionally. In some cases he got too near the edge and after receiving more material than he had the right to accept, owing to his credit, he toppled over, but in the majority of instances they pull the chestnut out of the fire and the builder and contractor and manufacturer and dealer will come out whole on it, but Rock Products fears that too much speculative building will be the curse of the industry, and in a few years we will all be laid up high and dry with our material and there will be a lot of buildings without tenants, which seemed the experience during the booms in the Southeast and in the middle West, which have left enough burns in a building material way not to have encouraged the same amount of speculative building that is going on right in this year of 1907. The material man depends too much on the lien laws and he oversteps good business methods in his anxiety to get orders by running the chance of losses. It is a good deal better to do a little less business than to try to do it all in one year, and we hope that the builders' supply manufacturer and dealer will keep this in mind.

Banks Advise Material.

Carelessly walking down Fifth Avenue one evening with nothing particular to do I dropped into the Night and Day Bank because it looked good on the outside. After feasting my eyes on the beautiful white marble that Alabama had furnished; but I was more attracted as the manager suggested that I go below—that is down in the safety deposit vaults where I found that the panels of the walls are of mosaic with the figures of dawn, the trumpeter and crescent-browed night on Pompeian red background. The floor of the vault cost \$2,000.00. The figures, to be exact, are not over 15 by 25 as a floor space, and yet the hardened shale tiling was as substantial looking as the armored steel vault which was a foot thick. All the materials in this building, from the green marble which is quarried in Africa, to the white marble in Alabama, all show an artistic refinement and evidences what can be done if the material man will only push his goods.

A beautiful office of this character would not have been thought of twenty years ago, because the banking office would not pay as good interest as loaning the money out; but the investors in this night and day bank considered well what they had before them, spent their money for one of the best corners on Fifth Avenue, and when they built the building that was in keeping with the new library two blocks below. And in the rebuilding of upper Fifth Avenue of the future, whether of concrete construction, limestone or granite, the materials will be moulded on a more extravagant scale, and the artistic and the beautiful, as well as the substantial idea, will be carried out—thus illustrating the contention of Rock Products that if the material interests will put their best foot forward and influence

architect, contractor and builder, the adornments in the shape of a building will catch the idea of even the uninitiated. We confess we were charmed with the interior and the exterior of the Night and Day Bank, and what will please the eye of the casual observer will be passed along from one neighbor to the other.

The Specification Index.

Every architect of enterprise has more or less system in his make-up, or has somebody around the place who has the system for him, and where he draws plans, specifying particular materials, he can class to his advantage in his card index the materials much better if he has Rock Products on file, and has read the stories by our special correspondents from the various branches of the stone field. For instance, if he wants a certain character of marble, we can tell him where to get it. If there is a demand for white cement, because we have covered the field we know where to find it. If it is hydrated lime of a certain chemical analysis, it is either made by one of our advertisers or one of our readers; so that in editorially covering the various branches of the building material business—that is the product of the quarry—Rock Products is the encyclopedia, as it were, and aims to compile for our readers just the data they need, be it architect, contractor, dealer, or even the consumer. Therefore, in making up any specifications where building material is used, if a man does not have Rock Products on file, there is no combination of books in print that will give him the data in so handy a form, and that's why we are mentioning the matter to you.

Experts.

There are experts and there are experts as you have no doubt found out when in quest of particular information about certain classes of material. One chemist will decide, because it has been habit, that his rule of three, learned at his school, is the only way for a manufacturer to produce a certain kind of lime. That point of argument, however, does not materially affect the business. Where the chemist or engineer on a certain class of work satisfies himself by some mode of reasoning that the analysis of this brand of cement makes it the only desirable one for certain work, and where a manufacturer of some other brand makes a deal with the purchasing agent he has a scrap on right along with the engineer, and we have urged time and again that the easiest way to prove to our scientific friend that this other particular brand is all right is to take him to the quarry and cement mill and let him spend enough time to see what the mix is—what the analysis shows for a certain mix for certain period of time, and what the material will do from a laboratory standpoint. But the cement manufacturer should then demonstrate some more by assisting the engineer to understand that the analysis at the mill is different from that on a job of work where the mix is not the same, and really if you'll investigate you will find that the contractor through his hod-man has made the mistake of changing his one-three-six, or to some other denominations which will make the mortar on an entirely different basis than was intended, and I am sorry to say that some of the engineers have overlooked this fact, and expect the manufacturer to pay the bill when it is discovered that this mix is not a satisfactory one and the result was not in accordance with the specifications of The American Society for Testing Materials.

The Scope of Your Vision.

"Uncle Joe" Cannon, the veteran father of the House of Representatives cited an illustration recently in his observations as to the Rivers and Harbors appropriation. He remarked that his vision, owing to the fact of his being a country member once upon a time, was through a gimlet hole, but was very thankful for the fact that he of late years had been looking through an auger hole and could see the greater excuse for larger appropriations. To be perfectly plain, it occurs to the writer that our industries as a whole, especially the building interests of the United States, have too often looked through that gimlet hole and imagined that it was as large as the biggest auger. However, we learn differently as we rub shoulders with our fellow man, and we are not so narrow in our ideas. Large operations and good fair profits is a splendid educator, and it is to be hoped that this industry, which is built on rock, with the starting of the new year will not be satisfied unless our auger hole is the largest made.

From Our Own Correspondents.

BUFFALO, N. Y.

BUFFALO, N. Y., January 17.—Colonel H. M. Adams, of the U. S. Corps of Engineers at Buffalo recently issued his annual report in regard to the improvements at Charlotte Harbor, Lake Ontario. Much concrete is being used in the work. Col. Adams says in part as follows:

"During the fiscal year 540.75 linear feet of the west pier and 297.5 linear feet of the east pier were reconstructed and the old timber superstructure replaced with concrete. Minor repairs were made and the channel maintained. At the beginning of the fiscal year the work of reconstructing 865 feet of the west pier and 363 feet of the east pier and replacing the timber superstructure with the concrete was under way with hired labor; three new cribs were nearly completed, the old west pier torn out for 306.25 feet to a depth of ten feet at low water, and the making of concrete blocks had been commenced. At the end of August all the cribs had been sunk and the placing of the concrete was in progress. This work was carried on continuously until December 10, 1905, when work was suspended for the winter. During the season 540.75 linear feet of the west pier and 297.5 linear feet of the east pier were rebuilt, eighteen of the old cribs being torn out and one from the east pier. New cribs were sunk, so that their tops after settling were below the zero of the Oswego gauge and were allowed to settle at least one month before being leveled for the concrete blocks. The total cost of the work of reconstruction during the season was \$32,741.13, or \$57.39 per linear foot. The cost of making and placing concrete blocks was \$7.79 per cubic yard. It is estimated that 1,300 feet of the piers should be torn out to below the wrecked cribwork, new cribwork put in and then covered with a concrete superstructure without necessary delay. The piers are well settled down but require extensive repairs to the crib substructure, and should, when repaired, receive concrete superstructure instead of being rebuilt with wood. This will cost, it is estimated, \$55.00 per linear foot or \$71,590.00."

The Excelsior Steel Ball Co. has in process of construction an addition to its plant on the Military road, just outside the city line, Buffalo. The H. & B. Concrete Co. is building the addition, which is a large, hollow concrete building, one story high, 137x50 feet, with an L 40x90 feet. The additions will cost \$15,000.00 to \$20,000.00, when completed. J. P. Maddigan is the architect. The new structure will be fireproof throughout and the roof will be constructed with steel covered with tile. A brick flooring will be used.

The Strawberry Island Co., which has just been incorporated with \$30,000.00 capital, has taken title to the upper part of Strawberry Island, a low-lying island in Niagara River, about opposite Riverside Park, Buffalo. A valuable tract of gravel is on the island and may be developed. The directors of the company are Charles A. Pooley, Maurice C. Spratt and Hugh E. Rourke, who are local counsel for the New York Central, but they say the railroad has nothing to do with the new company.

AROUND SYRACUSE.

SYRACUSE, N. Y., January 15.—Building operations are slack and contractors are availing themselves of the leisure time to size up last year's business and to prepare for the coming season, which they expect will be one of the busiest they have had in years. The cement market has weakened somewhat of late and is about the same as it was a year ago. Syracuse contractors are paying \$1.10 to \$1.15 at the mill net.

Syracuse manufacturers are just waking up to the advantages of reinforced concrete buildings and two immense structures are now under way,

the Brown-Pepegear Co. building and a six-story storehouse, which is being built by the Flagg Storage Warehouse Co. Both of these buildings have reinforced concrete floors and concrete columns and beams.

In the Flagg warehouse the carrying capacity of the first floor is figured at 300 pounds a square foot, that of the second and third floors at 200 pounds and that of the fourth and fifth floors and roof at 100 pounds. The work is being done by the Expanded Metal and Fire Proof Co., of Pittsburgh, Pa.

The Kirkville Clay Products Co. has been incorporated and will have its principal office in Syracuse. It will manufacture and sell brick, clay and other products. The capital stock is \$15,000.00 and the company starts business with \$4,000.00. The incorporators and directors are: Isadore Putziger, who takes 175 shares; Herbert B. Myron, who takes 13 shares, and William Ryan who takes 12 shares.

The Canal Quarry Co. held its annual meeting at Syracuse and elected the following directors: W. E. Baldwin, W. E. Webster and S. G. Schlachter. The directors elected W. E. Baldwin, president and manager, W. E. Webster, vice president, and S. G. Schlachter, secretary. The company owns quarries at Lockport, N. Y., and furnishes crushed stone in large quantities. The company is now working on a big contract building the Breakwater at the south entrance to the Buffalo Harbor. The quarries are located on the Barge Canal.

C. J. Sullivan will start in February 1, making cement blocks. He will make up a stock this winter for spring use. Mr. Sullivan reports that the outlook is especially bright for side walks, paving and cement work. He has been putting in 20,000 feet of cement floors in Syracuse University buildings. He has also finished several paving jobs using Johnsonburg block.

George W. Pack & Son are doing a big business on Hudson cement. Their purchase of the Adamant Plaster Co.'s business has proved a successful venture.

A company with Frank N. Freeman at its head has been formed at Gouverneur to carry on a block business with \$100,000.00. A power house and mill will be built at Sullivan Falls with a capacity of 75,000 pounds.

At the annual meeting of the Central City Paving Co. Guv B. Dickinson was elected president, H. Ward Dickinson, vice president and H. J. Stevens, secretary. The officers and J. C. Dempsey and William Dickinson were chosen directors.

The Selden Motor Vehicle Co. will build a reinforced concrete factory at East Rochester, N. Y.

The Board of Contract and Supply, of Syracuse, has awarded several contracts for sewer and paving work to Samuel Bonn.

PITTSBURG AND VICINITY.

PITTSBURG, Pa., January 14.—Concrete and cement work in this city and vicinity, most of which had been discontinued for the winter, has suddenly been revived on account of the unusually warm weather, and contractors who had late work of this kind on hand, have found themselves able to proceed and thereby gain an extra month's work. The past four weeks have been excellent for concrete construction, and an immense amount of work has been accomplished. When December came, there was more work of this character in the hands of the contractors than there had ever been at that time of the year.

The year just closed was the greatest that this city has ever had in the amount of concrete construction and building, and placed the city, which, since the use of this great material became general, has been in a degree backward in the adoption of its use, well up among the leaders in the use of Portland cement as a factor in construction. More cement was sold in the Pittsburgh district in 1906 than in any previous year, the increase being about 25 per cent. During the year, several large reinforced concrete warehouses were started and practically finished, while a number of others were started, and are now under way. Among the latter is the immense sixteen-story Hostetter Building, which will, when completed, be one of the largest reinforced concrete structures in the United States.

Looking forward into the prospects of the coming year, there is every indication that the fine record of 1906 will be broken, and in all probability by fully as large a percentage as 1906 showed over 1905. The year has started with peace in

the building trades, and little prospect of labor troubles, which so badly hampered work for about four months last year. For this reason, builders have regained confidence, and announce that in the spring they will be ready to proceed with improvements contemplated last year, but which were called off on account of the many strikes.

Cement, for a portion of last year was hard to obtain, and there will be several plants erected in the vicinity of Pittsburgh during the coming year.

Owing to the mild weather, the Hennebique Construction Co. has been able to practically complete the new reinforced concrete buildings for the Pittsburgh, Fort Wayne and Chicago Railway Co., and the Adams Express Co., both on Federal Street, Allegheny.

The Concrete Steel Construction Co., with offices in the Times Building, Pittsburgh, has been incorporated by J. F. Berger and Charles W. V. Feigel, of Pittsburgh, and W. S. Cooper, of Bellevue, Pa. The capital stock of the company is \$10,000.00.

The Trussed Concrete Steel Co., of Oakmont, Pa., has moved its office to Pittsburgh, and is now located in room 1035 Fulton Building.

The Reinforced Concrete Construction Co. has opened a new office in room 1034 Fulton Building, Pittsburgh.

The concrete bridge at West Winfield, Pa., connecting Armstrong and Butler counties, has been completed, and is thought to be the largest concrete bridge east of the Mississippi river.

Lemon & Wolcott, Hazelwood, Pittsburgh, have received the contract for the erection of three cement block residences on Montclair Street, this city, for Mrs. Minnie E. Butler.

Haupt Brothers, Bellefonte, Pa., have been awarded the contract for the new concrete floor and corridors of the Centre County jail at Bellefonte. There are several thousand square yards in the contract.

A. S. Anthony, of Wylandville, Pa., has started the construction of a concrete block house for his own occupancy. The blocks are being made on the ground by the "Miracle" process.

Amos Trout, of Armbrust, Pa., has purchased the concrete block plant of Samuel Cummings, at Youngwood, Pa., for \$3,000.00. The new owner will enlarge the plant, and equip it with machines of the latest design. There is an excellent demand in the vicinity for cement blocks for culverts, foundations and walls along the new railroad improvements that are being made.

J. A. Lord, Hastings, Pa., has been awarded a contract calling for about a mile of concrete sidewalks in that town. He will not start the work until early in the spring, however.

The big plant of the International Portland Cement Co., located at Elizabeth, Pa., which was almost destroyed by fire in December, will be rebuilt at once, and on a larger scale than before. Most of the machinery was either totally destroyed or badly damaged, and accounts for the principal part of the loss. The plant, which gives employment to about 100 men, will be in full operation in the early spring.

The Simon Packing Co., of Youngstown, O., has awarded a contract to the Modern Construction Co., of Terre Haute, Ind., for a reinforced concrete packing house, to be built at Youngstown. The new building will be 145 by 164 feet, three stories in height, and will cost in the neighborhood of \$30,000.00. In taking the contract, the contractors made an agreement to have the building completed by July 15, 1907.

The New Castle Cement Co. will erect a modern cement making plant in Muddy Creek township, near New Castle, Pa., at a cost of \$50,000.00.

A charter has been granted to the Oursler Concrete Co., of Pittsburgh, and a plant for the manufacture of curbing, etc., will be built in the East End, Pittsburgh. The company is capitalized at \$50,000.00.

CLEVELAND AND NORTHERN OHIO.

CLEVELAND, O., January 15.—January has been ushered in in a most auspicious manner in Cleveland, business reports showing a better state of affairs than ever before. Even though the open winter threatens and building operations have been interfered with to some extent, trade is not nearly as dull as is usual at this time of the year. Several concrete buildings are being finished despite the chilly weather and the outlook for the spring season is reassuring.

The year 1906 will be gratefully recollected in Cleveland for having smashed in ruthless fashion, all previous building records for this city. For 1906 the number of building permits issued was

7,526, at an aggregate cost of \$12,945,222.00 as against 4,976 permits for the previous year at a cost of \$9,777,045.00. As permits usually state but 60 per cent of the real value it is assumed that between \$16,000,000.00 and \$20,000,000.00 worth of building has taken place in Cleveland during the past year. Local building concerns look for an increase on this record for the present year.

The Kelley Island Lime and Transport Co. is preparing to move its offices March 1 from the Commercial Bank Building to the new Rockefeller skyscraper which is just opposite. Half of the seventh floor has been engaged by this company to meet its growing demands for more room. Although January is usually a dull month with this concern a brisk month's business is reported. All the company's boats, which run to Kelley Island, are tied up but large stocks of crushed stone and lime are on hand to supply the trade. The new crushed stone plant at Marblehead is now in operation and assisting the company in meeting orders for crushed stone. The new kilns, twelve of them, at White Rock, also went into operation this month, increasing the plant about 75 per cent. When the company gets into its new office quarters the cement department will be separated from the other lines and operated under the name of the Lehigh Portland Cement Co. Caleb E. Gowen, who has been in charge of this branch of the business, will continue as head.

The Reinforced Concrete Co., with offices at 3711 Carnegie Avenue, through its manager, Fred Ackert, reports a fine year's business. This concern has erected fifteen or sixteen structures in this and other cities. Two of the largest are located on Oregon Avenue, Cleveland, one being a six-story \$100,000.00 power block for the Perry-Payne interests, and the other a four-story concrete barn for the Cleveland Transfer Co.

The National Concrete Fireproofing Co. has been awarded the contract for fireproofing the new \$100,000.00 St. Luke's hospital on Carnegie Avenue. J. H. Libby has been awarded the contract for the concrete flues and sidewalks in connection with the new postoffice.

The Humphrey Co. will erect a large concrete building to cost \$50,000.00 at Euclid Avenue and E. 107th Street to be used as an indoor ice skating rink. The building will contain a large auditorium. It will contain modern ice making machinery.

The Stowe Fuller Co., controlling six fire-brick plants in Ohio and adjoining States, reports that the demand for fire-brick is active and that the opening of the spring season will probably see an increase in the price of fire-brick. The company is at present contesting with the Interstate Commerce Commission certain freight rates on fire-brick fixed by railroads East, claiming discrimination. The matter will come up for a hearing some time this month when the commission meets in Cleveland.

J. A. Kling, manager of the Cleveland Builders' Supply Co. went to Florida January 7 for a much needed rest. R. C. Mitchell, who is agent for the brick department of this company, says that the outlook for the spring building trade is exceptionally bright and that vast amounts of material will be needed during the coming year.

Extensive repairs and alterations have been made to the plant of the Cleveland Hydraulic Brick Co., located at South Park. These alterations have been under progress for several months. The appointment of John J. Hunt as superintendent of the plant has been announced.

Considerable interest is being manifested in connection with the new roof on the Hippodrome Building which is in course of construction on Euclid Avenue. This will be the largest theater in Cleveland. The roof, which is nearly 200 feet square, is constructed entirely of concrete. Huge iron girders support the roof which is six inches thick and coated with tar to properly shed the water. This is the first time a roof of this character has been tried in this city and it will be watched with interest.

The Carey Construction Co. is busy preparing for the construction of the new parochial school for the St. Stanislaus Catholic parish, to cost about \$80,000.00. It will be the largest parochial school building in the city and will be constructed of concrete.

Work has been stopped until spring upon the new breakwater being constructed to enclose the Cleveland harbor. Thousands of tons of rock are used and large quantities of cement. At the harbor entrance a lighthouse must eventually be erected. It has been suggested by interested Clevelanders that the lighthouse be of concrete in-

stead of wood or sheet iron. It is contended that a concrete lighthouse will be more in keeping with the general solid nature of the harbor improvement. Government officials are taking the matter under consideration and the recommendation that a concrete structure be erected will probably take definite form. Local architects will be called upon for designs by Cleveland marine men when the time comes for the lighthouse to be erected.

LOUISVILLE, KY.

LOUISVILLE, KY., January 21.—The continued rains for the past three weeks, coupled with the extreme cold weather that has just set in, has kept the concrete building industry at a standstill. Most of the concerns have innumerable orders on hand and work in view, but inclement weather has made it impossible to make any progress.

The office and yard of the Ohio River Sand Co. is at a standstill, owing to the encroachment of the flood, which has over-topped the entire levee.

The Keystone Wall Plaster Co. is in practically the same condition, and will be until the flood recedes.

At the plant of the Falls City Artificial Stone Co., the work of alteration has been stopped owing to incessant rains, although Mr. Simon is awaiting for a cessation of the wet season in order to complete his installation referred to in our last issue.

Neil Monks, of the Southern Roofing and Supply Co., has also had his troubles with the flood, which has done considerable damage to his stock in his warehouse, and for the present is unable to work on his various local jobs until the flood abates.

Held up by the storm and flood is also the report of Webster Gasley, of the National Concrete Construction Co., which is one of the city's most progressive concerns.

Robert Morris, president of the Central Concrete Construction Co., advises that the water has reached his plant at 1641 Hamilton Streets, and that while they have plenty of orders, they are unable to do any work in the making of blocks at this time.

The flood has also damaged the office of Fitch-Troxell & Co., on Fourth Street, to a considerable extent; hence there is a tie-up at this establishment also.

W. Courtney, of the Western Cement Co., advises that the flood has done considerable damage to three of the plants which he represents in this territory, but to just what extent he was unable at this time to determine.

Henry Gray, of J. B. Speed & Co., advises that they are looking forward to rush work on the addition to their Portland cement plant, as soon as the high water recedes. They have had a most prosperous year, and with the demand that is likely to mature in 1907, they feel that every barrel will find a ready market.

NASHVILLE AND THE SOUTHEAST.

NASHVILLE, TENN., January 14.—Trade in this district is good for the winter time and contractors and supply men look for a more active business after March 1.

The Newsom Crushed Stone and Quarry Co. of this city, is getting out some concrete columns and concrete lawn vases that are proving popular with the Tennessee trade.

A petition in bankruptcy was recently filed at Nashville by T. A. Brown & Co., contractors on Second Avenue South, in which their liabilities are placed at \$6,966.00 and assets about the same. The firm had been engaged in the lime and cement business for some time.

The Manley Construction Co., of Chattanooga, Tenn., will erect a concrete block house for the James Supply Co. for warehouse purposes in Chattanooga.

The Standard Reduction Co. has been incorporated at Blakely, Ala., with a capital of \$100,000.00 by C. W. Johnson, D. H. Tilden and others. The object of the company is to deal in clay products.

William J. Neel and H. J. Galt will establish at Cartersville, Ga., a plant for the manufacture of paving tiles, building blocks and pressed brick. The capital stock is \$5,000.00.

J. W. Pace, of Albany, Ga., has bought of J. M. Tift, a half interest in 400 acres of sand hills east of Flint river and will develop them.

MEMPHIS AND THE SOUTHWEST.

MEMPHIS, TENN., January 14.—The builders' supply trade in Memphis bids fair to have a good patronage this year. Many public and private buildings are under plan. A million dollar courthouse is to be built and the site for this structure is now being cleared. A large newspaper building for the *Daily Commercial Appeal* is to go up. Many residences of concrete are to be erected and are under plan. At the same time competition in this line of business is keen in Memphis and despite the general advances with the manufacturers on their products, dealers have not been able to advance theirs in proportion.

The cement, brick, lime, slate and roofing dealers here are carrying good stocks. They receive their shipments almost entirely by rail. Local firms are going out to other cities and capturing contracts and nobody is complaining over a lack of business.

Steve Wright, of the Wright Lime and Cement Co., has just returned from Chicago where he attended the cement convention this month. Mr. Wright looks for a good year in Memphis.

Chas. W. McDaniel, of the Memphis Granolithic Co., has been spending a few days in Bristol, Tenn., on business and will go from there to Northern points, making contracts for supplies and studying the latest features of granolithic stone and concrete work. His plant is four years old and has built up a fine trade in Memphis.

The Memphis Brick Supply Co. has made application for a charter with a capital stock of \$40,000.00. The incorporators are: G. W. McRae, O. H. P. Piper, R. A. Speed, Frank H. Reid and John J. Bishop. The new concern will handle the product of the Tennessee Brick Co. and will take agencies for building material, cement, etc. The stockholders of the Memphis Brick Supply Co. and the Tennessee Brick Co. are practically the same, and the organization of the company is affected simply to divide the business with the parent company, to handle its supplies. The new company will not erect a plant but will simply establish offices in some centrally located up-town building. The company will deal in lime, cement, etc.

The Concrete Construction Co., of 110 South Front street, is manufacturing a two piece building block. A heavy hydraulic pressure is used. The stone has been much complimented by users.

The Joplin Cement Co. has been chartered at Joplin, Mo., to handle and manufacture all kinds of building material. Those in the company are: William B. Myers, Arch McDonald, Charles and A. G. McDonald.

Mrs. J. E. Blakeman has been endeavoring to organize at Carrollton, Mo., a factory for the manufacture of concrete fence posts.

Masner & Cruikshank have entered the cement stone business at Kimball, Neb.

Carlson & Close, of North Platte, Neb., have purchased a brick machine which they will operate in that city next season.

The plant of the Iola Portland Cement Co., located in West Dallas, at Dallas, Texas, is being entirely rebuilt and greatly enlarged. The new machinery being installed and additions to the building will involve an expenditure of \$300,000.00. S. H. Bassett is president and general manager of the company.

George White is putting up a frame factory building at Hutchinson, Kan., and will go into the cement block business. His plant is 250x50 feet and is located between West Bigger and West Campbell streets.

At a meeting of the board of directors of the Western Roofing Tile Co., at Coffeyville, Kan., recently held, General Manager A. G. Hess was given authority to commence rebuilding the plant at once.

J. F. Townsend, of Akron, Ohio, president of the Chanute Cement Co., of Cement, Kan., is at Chanute looking after the possible erection of a plant west of Chanute and north of Vilas. The Chanute Cement Co. owns large holdings west of Chanute.

Tim Casey has begun work on a steam cement block plant at Hutchinson, Kan. The cement blocks are to be made by a steam pressure machine. Mr. Casey will spend about \$7,000.00 getting his plant in first class condition. He has just purchased a large steam engine.

THE WEST COAST.

SAN FRANCISCO, CAL., January 9.—The building situation is still satisfactory although occasional rain storms during the past few weeks have meant slower progress in the erection of numerous re-inforced concrete buildings. Many buildings are, however, advanced so that much finishing work can be done under cover. Reconstruction work is being pushed on a number of big skyscrapers that were badly damaged by the fire. The owners of the St. Francis Hotel are sparing no expense to complete its rehabilitation. The contractors are working a large labor force in the efforts to have the building ready for occupancy in April but it will probably take longer to finish all details of decoration and furnishing.

The Jean M. Boyd-Alexander Building, which covers nearly an entire block, fronting on Davis, California and Market streets which is to have ten stories, in time, has been run up to the third floor. It is now the largest re-inforced concrete building in the city. It has concrete slab footings and is erected on made ground.

The cement market is firm at better prices than a month ago, notwithstanding the curtailing of outdoor work on account of the heavy winter rains and the arrival of large quantities of foreign cement in December. Importations from Europe for the month were 132,531 barrels.

It is understood that the local cement manufacturers are largely sold ahead so that little domestic cement can be purchased for immediate delivery or even for delivery before February. Prices on the cement manufactured in California have advanced about 25 cents a barrel, making the present price \$2.50 to \$2.60 a barrel. The consumption of cement for heavy foundation work has been increasing all winter and will not reach its maximum for a long time to come. Numerous contracts for excavating and driving piles preparatory to the laying of concrete foundations for large buildings are proof of this statement. The total importations of foreign cement at the port of San Francisco during the year 1906 was 340,722,284 pounds.

Meyerstein & Rothchild are ready to let contracts for the erection of an 8 story re-inforced concrete store and office building on Grant avenue and Geary street. The building, which is to cost \$160,000.00 has been leased by the John Breuner Co. for a long period.

The construction of a handsome Class A re-inforced concrete theater building on Ellis street between Fillmore and Steiner proceeds rapidly this winter. Steel and other materials required have been delivered for the erection of the theater which is to be known as the Princess. It adjoins the new Orpheum Theater on the west. O'Brien & Werner prepared the plans for both the buildings. The Ellis Street Amusement Co. will lease the new theater, which is being erected by T. H. B. Varney and T. C. Green.

The six story and basement concrete-steel Class A building erected for the John Breuner Furniture Co., at the corner of Thirteenth and Franklin streets, Oakland, Cal., is the largest re-inforced concrete structure yet completed on the San Francisco Bay. Lindgren & Hicks superintended the construction work.

The Western Meat Co. has applied for a permit to erect a two story re-inforced concrete market building to be located on the northeast corner of Sixth and Townsend streets at a cost of \$80,000.00. It will be equipped with an extensive cold storage plant.

The Fourth Street Improvement Co. will erect a three story hotel building on the northeast corner of Fourth and Howard streets, to be called the Royal House. The structure will be of re-inforced concrete, containing ten stories on the ground floor and 200 rooms on the upper floors. The building will cover the corner lot 85x125 feet and an L 50 x 160 feet to Tahama Street and will cost more than \$135,000.00. J. Eugene Freeman, architect, has designed the building and will supervise its construction.

A. Legallet has made application to the Board of Works for a permit to erect a six story re-inforced concrete building at the northwest corner of Battery and Jackson streets to cost \$125,000.00.

E. B. Pond is erecting a 5 story and basement re-inforced concrete modern loft building at the

corner of Mission and North Anthony streets covering a lot 68x187 feet. The floors are designed to carry a load of 300 pounds a square foot. T. W. Braum & Co., wholesale druggists, have leased the entire building.

M. J. Brandebstein has secured a permit for the erection of his 5 story re-inforced concrete building at the corner of Mission and Spear Sts. It will be used for stores and lofts. The American-Hawaiian Construction Co., has the contract for the work.

The Inglewood Cemetery Association, of which Mark Jones is president, has voted the issuance of \$75,000.00 in bonds for the erection of a re-inforced concrete and granite crematory, near Los Angeles, Cal., to contain a chapel and have a seating capacity of 300.

The Los Angeles Artificial Stone Co., has been incorporated with a capital stock of \$25,000.00 by David Pitzel, Peter Brutig and M. J. McGarry.

The McCarthy Co., of Los Angeles, has let to House & Woodward of the same place the cement work for four and three-quarter miles of sidewalk and the same amount of curbing to the principal streets in the company's new Florence Heights tract.

To provide funds for the erection of a cement plant and auxiliaries at Kendall, near Bellingham, Wash., the Northwestern Portland Cement Co., of San Francisco, has filed with Auditor Miller, a first mortgage deed to its holdings on favor of the Mercantile Trust Co., of the same city, whereby a \$2,000,000.00 bond issue is secured. This means that actual construction will be commenced on a cement plant with capacity of 2,000 barrels a day. John L. Howard, of San Francisco, W. J. Dwyer and Frank A. Losh are interested in the company. Balfour, Guthrie & Co., are behind the project which will employ 500 men.

According to advices from Bellingham, Wash., a third Portland cement company is attempting to get control of the valuable clay lands and limestone deposits of Skagit and Whatcom counties for the purpose of establishing a manufacturing plant. James Lindsay, of Portland, is promoter.

The Butte Portland Cement Co., is rushing preparations for the erection of its large cement mill at Butte, Montana. Eighty-five car loads of machinery will be required for its equipment.

E. A. Randig and Eugene Easton will soon open their cement pipe factory at Bloomington, Cal.

W. P. Hammon, the gold dredging magnate of Oroville, Cal., who with his associates recently purchased the Alta Lime and Brick Co.'s property and plant near Morley, Shasta county, Cal., intends to establish a cement, brick and lime plant on a large scale. Heavy machinery is already on the ground and work on installing the plant will shortly be commenced. An electric road will be built to connect with the plant. Mr. Hammon is identified with the Northern Electric Co.'s interests.

Theodore Weisberger, of North Yakima, Wash., has a contract for the concrete and steel work on the Tieton project, calling for distributing and laying twelve miles of concrete slips in the open canal, flumes and tunnels at an approximate cost of \$270,000.00. Completion is called for by April 1, 1908. Two million pounds of steel and 6,000,000 pounds of cement will be required and \$40,000.00 worth of machinery will be used in the way of crushers, concrete mixers, etc. Mr. Weisberger is planning to construct an electric plant to operate the machinery.

J. H. Spear, manager of the Washington Brick, Lime and Manufacturing Co., is planning the organization of a company to be known as the Inland Portland Cement Co., with a capital stock of \$2,400,000.00, for the purpose of building a cement plant either at Colville, Wash., or at Pond d'Oroville, Idaho. The capacity of the plant will be 1,500 barrels a day and work will be commenced as soon as weather conditions will permit, the plant to be in operation within a year.

The announcement is made that Shasta county, Cal., will have in about a year one of the largest cement factories of the Pacific coast, and that it will be located on the Holt & Gregg brickyard property one mile north of Anderson. Arrangements are now being made by the Holt & Gregg Co., and associates for the installation of the cement plant. The company has plenty of raw material. The new plant will cost in the neighborhood of \$1,000,000.00.

The City Council of Prescott, Ark., has granted a 99 year franchise and lease on a tract of

43 acres of the Duke ranch to Elliot & Drescher, who propose to erect a \$250,000.00 cement factory for manufacturing all kinds of cement material and articles. According to the agreement the new plant is to be in operation within three years.

The Superior Portland Cement Co., which is planning to erect a cement mill in Skagit county, Wash., on the west side of Baker River, at a cost of nearly \$1,000,000.00, has elected the following officers: John C. Eden, formerly traffic manager of the Great Northern Railway, president; F. B. Clarke, vice president; R. V. Ankeny, treasurer, and W. W. Butler secretary.

Captain B. Frank Cheatham, U. S. A., has forwarded to the War Department, Washington, D. C., the completed plans and suggestions for the great docks and warehouse system to be installed at Fort Mason, San Francisco. The wharves, costing \$1,000,000.00, will be of the most substantial character requiring considerable stone and cement in their construction.

Review of Roofing Industry.

A prominent member of the Master Composition Roofers, in writing to Rock Products, makes the following observations on the industry during the year 1906:

"Roofers seem to be enjoying a busy season in all parts of the country and the limit to the amount of work they can do appears to be the number of skilled laborers they can obtain. The country must certainly be in a prosperous condition if the demand for labor is an indication of prosperity, but in the roofing line the closing year will end with many unsatisfactory ledger balances. The past year a deluge of patent and ready roofing materials have been thrown on the market. They have come from every section of the country and are of every conceivable kind, many of them having been conceived in iniquity, as clients are now finding out with bought experience. Many of them have been used as temporary make-shifts to be put on by unskilled labor on account of the scarcity of skilled men, and many kinds are being used in the country on cheap sheds and surfaces too steep for the built-up roof, and also because they can be put on in a way by the carpenter or cheap laborer.

"But the majority of such roofs are short-lived and are liable to confirm the opinion of the owner of the house that the cheapest roofing is not always the best material to use, especially on permanent structures. In the city these ephemeral roofs do not meet with much success and their application is generally confined to covering old single roofs that are too steep for other material that is just as cheap. On our flat or nearly flat roofs in the city, which the fireman, the electric lineman, the telephone lineman and a host of other mechanics walk over, there is no roof that has been put on the market within the last fifty years that makes as good and satisfactory record as the standard gravel, slag or shell roof with a substantial foundation of high grade felt, and roofing cement or pitch. This kind of a roof is a standard from Maine to Texas, and any roofer that puts it on has no hesitancy in guaranteeing it for from five to ten years, as it has been fully tested during the last fifty years. But all roofs put on are not of the standard material. In fact, few of them are, when compared with the great number of the patent roofs. They have had such a depressing effect on the price that an honest roofer must ask for a standard roof that he is seldom a winner when he comes in competition, especially in dealing with an owner or architect who has not paid for his little experience in buying a roof. I believe the high tide, or perhaps you may call it the fad, for this makeshift class of roofs has been reached. With the large amount of this ready-made material on the market I do not believe the volume of gravel, slag or shell with felt and pitch as the foundation has been decreased. But they find their market in the increased demand the past year for work that can be done by the handy man and work that must be done. We can lay it all to Prosperity."

Will Manufacture Roofing Materials.

New York, December 18.—E. W. Grafton, Elizabeth Grafton and James W. Taylor are incorporators of Grafton & Son, a company formed for the manufacture of roofing materials.

Quarries.

The National Quarry Owners' Association

Meets Semi-Annually.

D. McL. McKay, Chicago, Ill. President.
Chas. A. Pfeiffer, St. Joseph, Mo. First Vice President.
E. T. Fancher, Albion, N. Y. Second Vice President.
Sol. M. Wolf, Bellevue, Ohio. Third Vice President.
B. H. Delebaugh, Louisville, Ky. Secretary-Treasurer.

Official Organ, ROCK PRODUCTS.

Fill Your Lamps.

We all remember from our Sunday school days the parable in Holy Writ of the five wise virgins and the five foolish virgins, who went out to meet the bridegroom. You remember that the five foolish virgins had no oil in their lamps and as a result were unable to light them and could not partake of the feast in honor of the bridegroom. Now we are neither a preacher or the son of a preacher, even if we have been termed a Moses, but we can not resist the inclination to preach a sermon to the stone crusher men with this parable as our text.

The year 1906 was the greatest in the history of construction in this country. Few operators in any of the many lines of the building industry were prepared for prosperity. Especially was this true of the stone crusher men; their equipment was short; their supply on hand was short, and their labor was short. Instead of there being five wise virgins and five foolish virgins the ratio was more like one to ten. Few were prepared to take care of the orders that came in a flood on them, and in fact so great was their business that many regarded the year as something abnormal and unusual. If they still believe that the year was abnormal they stand a good chance of again being classed as foolish virgins.

Great as was the year 1906 in the building industry the year 1907 promises to be still greater and outstrip its predecessor even as much as 1906 outstripped all previous years. Having already proved its claim to being the greatest factor in modern building construction the world has ever seen concrete is coming into its own and 1907 will probably see more buildings of this construction erected than in all the other years combined. Crushed stone forms the greater part by volume and weight of the concrete aggregate, and it is up to the stone crusher men to prepare to furnish all that the concrete men will need.

Now is the time in the winter months when your crusher is idle and you are figuring up your profits for the year to prepare for the tide of prosperity. This prosperity is no abnormal thing but represents the natural growth of the country. You can plan now how to meet the requirements of prosperity and he who is not prepared will be left out in the shuffle. If there is no oil in your lamps you will not be permitted to share in the feast of prosperity. In time of peace prepare for war. See that your equipment is large enough and that your supply of the raw material will not fall short. See now that your plant can be run with as little intermission for repairs as possible. Glance back over your record for the year and see what you can do now, that you may have to do when your crusher is running full time and orders are piling up fast. If you think that you have not been getting maximum capacity out of your plant, try to find out what the trouble is and remedy it now. You will not have time during the summer months.

So this is our sermon to you in this opening month of 1907: Fill your lamps full of oil and carry an extra supply with you so that you may have a seat at the feast of prosperity.

Suffolk, Va., is using crushed stone for the base of its street paving, and is securing most of its material from New York.

Stone on Chicago Canal.

The contract that the Sanitary Board of Chicago has awarded to John M. Ewen for the purchase of the stone lying on the banks of the main channel of the sanitary district has been made public by the board. By what means the purchaser will market the stone as well as the methods used are holding the interest of the crushed stone operators just at this time. Those that think they know say that Mr. Ewen will have more than he bargained for.

One effect it will probably have on the Chicago market, and that is, the price of crushed stone will take a drop, the operators trying to compete. It will be a stupendous undertaking to dispose of a minimum of 300,000 cubic yards of stone each year. It is estimated by the board that there are 20,000,000 cubic yards of stone on the banks of the canal. Mr. Ewen purchases all of this with the exception of that which the board has already contracted with others for or which it may require for its own use. Mr. Ewen has to furnish the machinery, crushers, scows and other equipment for removing and marketing the stone. The board will furnish the property on which to install the equipment as well as the electric power which is to be furnished at a cost the same as that charged other companies for the same service. The contract says if by July 1, 1916, 5,000,000 cubic yards have not been removed and marketed by the Ewen Co. the contract is annulled. All disputes are to be settled by a Board of Arbitration consisting of three members, one to be selected by each party, the two selecting the third. The Ewen Co. is to pay 10½ cents per cubic yard and a percentage of the net profits based on a sliding scale; 5½ cents a cubic yard is allowed for the cost of depreciation upon equipment; 1-1-3 cents a cubic yard as interest invested by the Ewen Co. Then on net profit the following is paid to the board: 50 per cent when the net profits shall be 35 cents a cubic yard or less, and 66-2-3 per cent when the net profits shall be 70 cents or more a cubic yard. When the net profits are between 35 cents and 70 cents the sliding scale will apply. The Ewen Co. must render to the board a complete statement in detail of all sales and deliveries made by them each month, rendering the statement by the 15th of the following month.

Crushed Stone for Good Roads.

CHARLESTON, ILL., December 1.—The Illinois State Good Roads Commission recently held a meeting here and visited the experimental road that is being constructed out on Sixth Street and each member expressed himself as being particularly well pleased with the road. Edmund J. James, president of the commission, said that there is five times greater demand for crushed stone than the commission can furnish. These macadam roads exceed all expectations and are easily kept in shape when once completed. The commissioners are planning to have a section of the experimental road at the State Fair next year so the farmers may see what the commission is doing.

Besides President James the commissioners are LaFayette Funk, of Shirley, McLean county, and Joseph R. Fulkerson, of Jerseyville.

Will Develop Stone Quarries.

BAY CITY, MICH., December 15.—Frank Buell and C. Campbell have formed a business partnership for the purpose of developing a vast body of limestone located in the vicinity of Haakwood, near the main line of the Michigan Central Railroad. The stone is said to be of an exceptionally high grade and it is proposed by those gentlemen to organize a company and operate on an extensive scale.

Will Supply Railroad Ballast.

AKRON, N. Y., December 15.—The Robert Grace Co., of Cleveland, has purchased the old Davis farm of Henry E. Owen, of New York, and will install a large stone crushing plant for the purpose of supplying ballast for the Lehigh Valley Railway Co.

The General Crushed Stone Co.'s plant at Le Roy, N. Y., is shut down for the season. The company has turned out about 300,000 tons of crushed stone this season, the largest in its history.

Heavy Demand on the Coast.

OAKLAND, CAL., January 2.—The marvelous increase in street improvements during the past six years is almost beyond comprehension. There are more miles of paved streets in Alameda County than in any other county on the Pacific Coast. The Blake-Bilger Co., successors to the Oakland Paving Co., have an immense quarry in Piedmont hills, the largest in the State, employing hundreds of men. The most modern machinery has been installed and a 400-ton crusher is continuously engaged in grinding out street improvement material.

Will Crush Stone for Concrete.

LYNCHBURG, VA., January 4.—Massey & Pierce are installing machinery for a rock crushing plant on the Durham branch of the Norfolk & Western, south of the city. The machinery which will cost \$20,000.00 is to be delivered by February 15, and the plant will be in operation a month later with an output of 600 cubic yards daily of stone for concrete purposes. The foundations for the machinery will be constructed so that the plant can be doubled without additional construction cost. Forty men will be given employment. The company is now erecting houses for its employees.

New Texas Crushing Concern.

DALLAS, TEX., December 31.—The Texas Stone Crushing Co., has recently been incorporated here with a capital of \$15,000.00. Dan Morgan is president, and R. A. Hegel, of Dallas, is vice president and general manager of the company. The company's plant is located six miles northeast of Sulphur Springs, Hopkins County, employs between fifty and sixty men and with the contract just received from the Cotton Belt railroad for 200,000 yards of ballast, will be kept busy during the entire season.

Experimenting for Road Material.

MILLERSBURG, IND., January 3.—The limestones of this vicinity which have been examined for macadamizing road purposes, have been found to have excellent wearing qualities. Lack of transportation, however, has delayed the opening of quarries. Good stone can be quarried here and sold at a much lower cost in Indiana than it can be shipped from Kentucky, from which most of the material is gotten for road building. This certainly is a large field for development.

Purchase Stone Crusher.

HARRISONBURG, VA., January 4.—A committee composed of J. G. Neff, of Mt. Jackson; C. W. Heater, of Middletown, and E. W. Carpenter, have purchased a 16 h. p. engine, a thoroughly up-to-date crusher from the Climax Co., of Marathon, N. Y., and two spread wagons with an adjustable bin, for the purpose of crushing stone for the Valley pike. The entire outfit will cost about \$3,000.00.

Doubling Capacity of Plant.

SUFFERN, N. Y., December 31.—The Clinton Point Stone Co., successors to the Cosgriff Trap Rock Co., has just purchased four acres of land between its present holdings and Rockland Lake landing, for \$35,000.00. The company is doubling the capacity of the plant, which, when completed, will be one of the largest in the country.

Muncie, Ind., is still using crushed stone for its street work. The A. & C. Stone and Lime Co. are taking care of this supply.

The Western Stone Co., of Chicago, Ill., has just closed the largest year in its history. The annual meeting was held January 16.

Thomas Quill, of Auburn, N. Y., has purchased the quarry, stone crusher and other machinery of the Edson Crushed Stone Co., at Waterloo, N. Y.

The Luzerne County Crushed Stone Co. has been incorporated at Wilkesbarre, Pa. The incorporators are: D. L. Creveling, J. Q. Creveling, P. A. Melxell, Christopher Wren and J. W. Davis.

The Charles M. Newton Trap Rock Co. has been incorporated at Little Rock, Ark., with a capital stock of \$100,000.00, of which \$300.00 has been subscribed. The incorporators are: Charles M. Newton, Oscar Davis and Walter J. Terry.

Eighth Annual Meeting of Cement Users.

THE third annual convention of the National Cement Users' Association held at Chicago January 8-12 was distinctly a success from every standpoint. A correct and complete list of the attendance was made impossible by reason of the fact that a large percentage of the attendance failed to register at the secretary's office and the six or seven hundred names that were registered were improperly listed by the printers' getting their types "piled." Undoubtedly the total attendance was upwards of 1,000 and possibly 1,200 would be nearer the correct figures, and these were composed largely of practical contractors, engineers and superintendents engaged in concrete construction or interested in the study of the great subject of concrete; besides, there were the manufacturers of concrete building material such as blocks, bricks, sewer pipes and ornamental structural casting of every description.

The widespread interest in the machinery exhibits which were in the commodious Seventh regiment armory can best be described by stating that on a 25 cent admission fee more than \$500.00 was taken at the door, representing 2,000 visitors in spite of the fact that more than 40,000 complimentary tickets had been issued broadcast by the exhibitors to every possible interested party within their reach. The Exhibit Hall was thronged with a moving crowd of spectators from the moment of opening the doors at noon each day of the convention up to the hour of closing at 10 o'clock at night. Those accustomed to computing similar aggregations of people state that it would take at least 5,000 different visitors to make up such a continual attendance, for they came and went at liberty, some only spending an hour or two, while others made numerous visits to complete their business engagements with the exhibitors.

The members of the association proper numbering about 218 at the close of the convention one year ago at Milwaukee, was augmented by a healthy increase, the exact number of which has not yet been announced by the secretary, but it is certain that the percentage is high owing to the growing interest in the very important work which is being accomplished by the association.

The President and every member of the Executive Board deserves unlimited approbation and support by every interest that centers around the promotion of the concrete industry in all of its phases. No man in this broad land who expects to achieve success in structural enterprises from this time forward can afford to hold aloof from this great liberally conducted organization. The men who attend the sessions of this association, who participate in the debates and who, by attendance are able to secure at first hand the full aggregate of all the trustworthy information developed by the acknowledged leaders in the business are those who place themselves immediately in a position to realize a measure of success which otherwise can be achieved only through the school of experience which would consume a lifetime in its accumulation.

Every session of the convention was well attended by the parties most deeply interested in the special subject under discussion as set forth in the official program. The hearty and liberal support of the association by the cement manufacturers and the machinery interests catering to the concrete industry was a notable feature. Of the future of the association it may be said, that so officered by representative able men and so supported by the material people interested, and so founded upon the development of valuable educational features free to an unlimited membership, there can be but one outcome, a continued growth in influence which will result in a mighty wave of progress in the development of the concrete industry, for this association really deserves for its cognomen, "The University of the Concrete Industry."

While the sessions of the association and the official headquarters were located in the Auditorium Hotel the delegates, members and visitors were located at other hotels, and in fact of every part of the great city of Chicago. There was not a man who attended the convention who went away dissatisfied. Indeed, there were many who proclaimed that in the educational features developed that they have found Aladdin's lamp which will hereafter solve all the difficulties that they have heretofore encountered and make their path of progress to success a matter of easy detail.

TUESDAY MORNING SESSION.

Promptly at 10 o'clock a. m., President Humphrey called the meeting to order, and the first business in order was the appointment of a Committee on Resolutions, consisting of H. C. Miller, of New York; C. C. Brown, of Indianapolis; Wm. Dickinson, of Chicago; H. H. Rice, of Denver; A. Monested, of Milwaukee, and a Committee on Nominations consisting of C. W. Boynton, of Chicago; J. W. Pawnska, of New Orleans; C. L. Jonsson, of Castalia, O.; Sanford E. Thompson, of Newton Highlands, Mass.; Mentor Wetzstein, of South Bend, Ind.

George L. Stanley, chairman of Committee on Streets, Sidewalks and Floors, presented his report which was ably prepared, containing suggestions from practical workings and practical results.

A thorough discussion and expression of views by those present brought out the necessity of providing for proper drainage for pavements and also the necessity of a good, deep, solid foundation.

The next paper on the program was "Cement Sidewalks," by Albert Moyer, New York City, which is printed in full in this issue.

CEMENT SIDEWALK PAVING. BY ALBERT MOYER.

Cement sidewalk paving is a manufacturing industry, whereby cement stone slabs are framed in place on the job. Paving of this description has various uses. Its principal use is a permanent path for pedestrians. Among the other uses are drive-ways for vehicles, a floor wearing surface for buildings, platforms in the stations of transportation lines, wharf coverings, cellar floors, curb and gutters. The principal object to be accomplished in manufacturing these cement stone slabs for the above named purposes are permanency, durability and neatness.

Its Permanency.—To accomplish permanency it is necessary that these slabs remain hard, tough and in the original position for the average life of good construction work. To accomplish this object, correct methods of manufacture must be employed, which will avoid settlement cracks, upheaval by frost and roots of trees, crumbling due to work having been laid in freezing water, contraction cracks, expansion cracks, separation of top from base and disintegration.

Settlement Cracks.—To avoid settlement cracks it is necessary to thoroughly ram the ground after excavating the foundation. After drainage foundation has been put in place this should be thoroughly and evenly tamped so as to avoid uneven strain. The thickness of the slab should be governed by the factor of safety necessary to provide for the weight that is likely to be placed on any one slab. It is estimated that a number of persons can be so crowded together as to cause a weight of from 100 to 150 pounds per square foot. As the strength of the slab is not always governed by its thickness, it will be necessary to properly proportion the aggregates so that maximum density results.

Upheaval by Frost.—To avoid upheaval by frost, a proper drainage foundation must be provided, such foundation to be carried to a sufficient depth to get below the average frost line as may occur in the various localities; a drainage foundation is of use only in event that it thoroughly drains. Such a foundation is often placed so that it not only fails to accomplish the purpose for which it was intended, but practically defeats that object

by causing an accumulation of water which in freezing upheaves the pavement. A drainage foundation should have an outlet which has a fall of about one-fourth inch or over to the foot. If there is no natural outlet for such drainage, blind drain leaders should be provided at points along the walk where they are necessary. These leaders should be formed of similar material as the drain itself, with possibly the addition of a porous drain tile leading into holes filled with cinders or crushed stone which will allow the surrounding earth to absorb the accumulated water.

Upheaval by Tree Roots.—This can be easily avoided by cutting out any roots which will run under the pavement higher than a depth of 18 inches to 2 feet.

Contraction Cracks.—Portland cement concrete expands and contracts in practically the same ratio as steel; it is therefore necessary to cut joints which will allow for this expansion or contraction. The concrete must be cut entirely through with a cleaver, or other instrument, from $\frac{1}{4}$ to $\frac{1}{2}$ inch wide, the blocks thus formed to not exceed 6 inches square. I am fully aware that very excellent work has been done, the blocks being as large as from 12 to 14 feet; that good results were obtained with such large slabs is due more to favorable circumstances than to correct method. By figuring the expansion and contraction per degree between the heat of summer and the cold of winter, it will be found that we are only within the region of safety when the slabs do not exceed 6 feet with an $\frac{1}{8}$ -inch joint between each slab.

Expansion Cracks.—Expansion cracks are not due so much to the expansion of the cement stone slabs as to the expansion of other material bearing against these slabs; it is therefore advisable to cut the concrete away from the manholes, iron posts, etc., leaving about the same space in the joints as between the slabs themselves. This space may be readily waterproofed by using felt paper painted with a good waterproof paint.

Separation of Top From Base.—In the past it has been a very common practice to allow the base to set hard before laying the top coat; it is unnecessary at the present date to dwell on this subject; we all know that it is utterly wrong. There are, however, other causes which prevent the top coat from adhering permanently to the base, the principal cause being carelessness in allowing men to walk over the base carrying with them dust and dirt, also failure to protect the base, allowing the surface of the base to be exposed to the rays of the sun and thus dry the surface prematurely, at the same time allowing dust and dirt to blow over the surface, coating the concrete so that the top when placed fails to adhere permanently. It is also absolutely necessary that the top be cut directly over the cuts in the base; otherwise the top coat will crack along the line of least resistance. To obtain good and permanent results whereby the top coat becomes a permanent part of the base, one brand of cement should be used in the top and in the base; the difference in time of setting, the characteristics of one brand being different from another, will often cause a separation of top from base.

Disintegration.—The principal cause of disintegration is insufficient mixing, drying out before ultimate crystallization of cement and bad material used. Start right and good results naturally follow. To avoid disintegration material should be carefully selected. This selected material must be thoroughly incorporated and mixed in a plastic mass with sufficient water to bring about ultimate crystallization of the cement. Being thus mixed it should be immediately placed, thoroughly and evenly tamped and then protected from drying out before final setting. Cement needs water, not only when mixed but after having been placed and tamped and it requires water until ultimate crystallization has taken place. If any portion of the concrete is robbed of the amount of water necessary to bring about this result, the concrete is weakened to that extent.

Selection of Material.—It is important that the best material be used in the manufacture of Port-

land cement sidewalks. Poor material makes poor walks and costs just about as much money. For a very strong concrete a hard stone without any surface scale is absolutely necessary. A rich mortar will not entirely counterbalance a deficiency in the strength of the stone. For a medium strong concrete, the hardest stone need not be insisted upon, but rather one to which the mortar will best adhere, such as some of the limestones. Stone-break in cubical form is far better than one breaking in the flat layers, such as shale or slate. It being almost impossible to ram or tamp such stone into such dense or compact a mass as that breaking in cubical fracture. The trend of the times is toward small stone. The writer advocates a concrete made of stone, all of which will pass through an inch mesh; and, better still, all of which will pass through a three-quarter-inch mesh and so graded in size that as far as possible the voids of each progressive volume are filled with the largest size particles that will fit them, graded from three-fourths inch down to fine dust. Thus a minimum of cement will give a stronger concrete in compression than could be obtained with a larger percentage of cement using the same quality of sand and stone, but not so well graded in size. A strong concrete can be made without the use of sand. Instead of sand, use screenings or quarry tailings made from only the hardest and toughest stone. These screenings are usually graded in size, each particle furnishes a better anchorage for the cement, greater density results, better adhesion and a stronger concrete than can be obtained by even the best of sands. Gravel is often superior to broken stone and sand, being generally found graded from coarse to fine; the roundness of the pebbles lends aid to compactness. Keep in mind that density is the object to be obtained. Maximum density is maximum strength under compression. Gravel is not likely to bridge and leave holes in the concrete. The coarse pebbles are harder, stronger and less liable to fracture. In discussing gravel versus broken stone, I am considering a concrete made of gravel and sand versus concrete made of crushed stone and sand, and in this discussion quartz pebbles, or rather very hard pebbles, are referred to. Sandstone pebbles are not considered as good as the better grades of crushed stone. The usual argument against gravel is that the mortar is not supposed to adhere as well to the surface as to that of fresh-broken stone. This is one of the theories which is practically due to the appearance of the surface to the eye or touch; the adhesion of mortar to limestone of a smooth surface may be far greater than to sandstone or rougher materials. If roughness was the only requirement for adhesion, it would seem impossible to cement together two pieces of glass. And from the standpoint of durability, gravel must be superior to stone for the reason that by the law of the survival of the fittest and by the process of elimination, nature has supplied us with the most durable. In selecting sand, the value of sand for concrete mortar depends largely on its coarseness and graduation in size of the grains. Avoid the use of fine sand. It makes a concrete which resembles pumice or punk. The reasons for this are well known. This is a subject which would require too long a time to discuss in this paper. The sharpness of the grain of sand has little to do with its value. It has commonly been supposed that sand should be sharp. The writer is rather in favor of a very coarse, round-grained sand. Compactness is what is desired and round grain will give greater density to the mortar than sharp grain, and cement will cling to the surface of round grain as well as sharp, the character of the surface being identical. Sharp sand as an indication of value is only useful in that it denotes a silicious sand. The best sand is that which, when mixed with cement and water in the required proportions by weight produces the least volume of mortar. The method of determining the best sands to use for the purposes of economy is another subject which is too lengthy to discuss in this paper.

In selecting Portland cement it is best to specify the requirements of the "Standard Specifications" as adopted by the American Society of Civil Engineers, and select for purchase that brand which is produced by manufacturers of experience and reputation, as ascertained from a number of well known engineers, their experience extending over a period of at least five years. The selection of Portland cement is largely that of reputation, the manufacturer having made a reputation by

producing a uniformly excellent article can not afford to sacrifice that reputation; a brand of long and good reputation having been purchased, the specifications and test of the American Society of Civil Engineers can be held as a check against errors or mistakes in manufacture. This method of selecting Portland cement always gives the user the best material obtainable at the fairest price—not the lowest price—making it to the advantage of the manufacturer to produce for the user's interest, also offering an incentive to the manufacturer to produce the best product at all times, making improvements as science advances.

Mixing.—Having selected the best materials obtainable, by far the most important operation is that of mixing. The methods employed in mixing by hand as well as by machinery, depend largely upon the character of the aggregates used. It is now being almost universally recognized that the small aggregates make the densest, strongest and best concrete. As a sample, in mixing a concrete made of three-fourths-inch hard limestone or trap-rock and good coarse sand, the cement and sand should be dry mixed, the best method is by use of shovels and a garden rake, each shovel full as turned should be thoroughly raked; dry three-fourths-inch stone is then added and the process repeated; the mass should then be formed into a crater, a sufficient amount of water added, then turned with a shovel and raked as before. By this method it will be found that a more perfect incorporation of all the aggregates results than if the mass had not been raked, but had been turned another time with the shovels; the raking takes the place of one turning, but does it better. A perfectly mixed concrete results if the shoveling and raking is properly performed. Another method is wet the mortar before the stone is added, proceed as before. I, however, have found that if quarry screenings or tailings are used for the mortar it is better to mix all the aggregates dry; that is, first the cement and screenings; then add the three-fourths-inch stone and mix dry; then add water necessary to bring the whole mass to the desired consistency, raking during each stage of the process as previously described; this for the reason that if the stone is added to a wet-mixed mortar, the mortar will work up into balls and lumps which are hard to break up, and which causes an uneven concrete; too much mortar in one place and too little in another. The same principle can be carried out in machine mixing for the smaller aggregates. Machine mixing should be accomplished much the same as in Germany, the mortar mixed dry, then the stone added, then the whole mass mixed dry; this entire mass is then run into another mixer and there mixed wet. This result can be fairly well accomplished by using a mixer which has knives and rakes, which does the same thing as turning and raking in the hand-mixed process.

Placing and Tamping.—The concrete should not be made so wet that it will quake under the tamping iron, unless steel strips are used for the joints or laid in alternate block; it should be sufficiently wet, however, so that some moisture arises in the surface under the tamping. The proportion of water necessary will vary according to the climatic and other surrounding conditions. The proper consistency can only be judged by the eye on the mixing board; no accurate specifications can possibly bring about uniform and desirable results. This is a matter which necessarily has to be left to experience. The tamping should be vigorous and uniform.

Drying Out.—One of the causes of bad workmanship is due to the concrete either in the top or the base having prematurely dried. This is avoided by keeping the concrete covered to protect it from the rays of the sun. If the concrete is anywhere near boilers or steam pipes; see to it that the concrete is wet continuously for from 24 to 36 hours; after this period sprinkle two or three times a day for a couple of weeks, or such length of additional time as economy will permit. Sidewalk paving slabs are acted on from both sides and being thin comparatively are more sensitive than mass concrete, therefore need greater protection. The writer has seen instances where workmanship as far as selection of materials, mixing, placing, and tamping were concerned was thorough and excellent, but, nevertheless, bad results were obtained. This was particularly true of a pavement laid over water-proofing. The atmosphere absorbed the moisture from the top and the top absorbed the moisture from the base. The base had nothing wet under it from which to get water, could

not supply sufficient moisture to the top to offset the action of the dry air, the result was a top of chalky consistency. Had the foundation been made very wet and the top covered with wet sand no such results would have been produced.

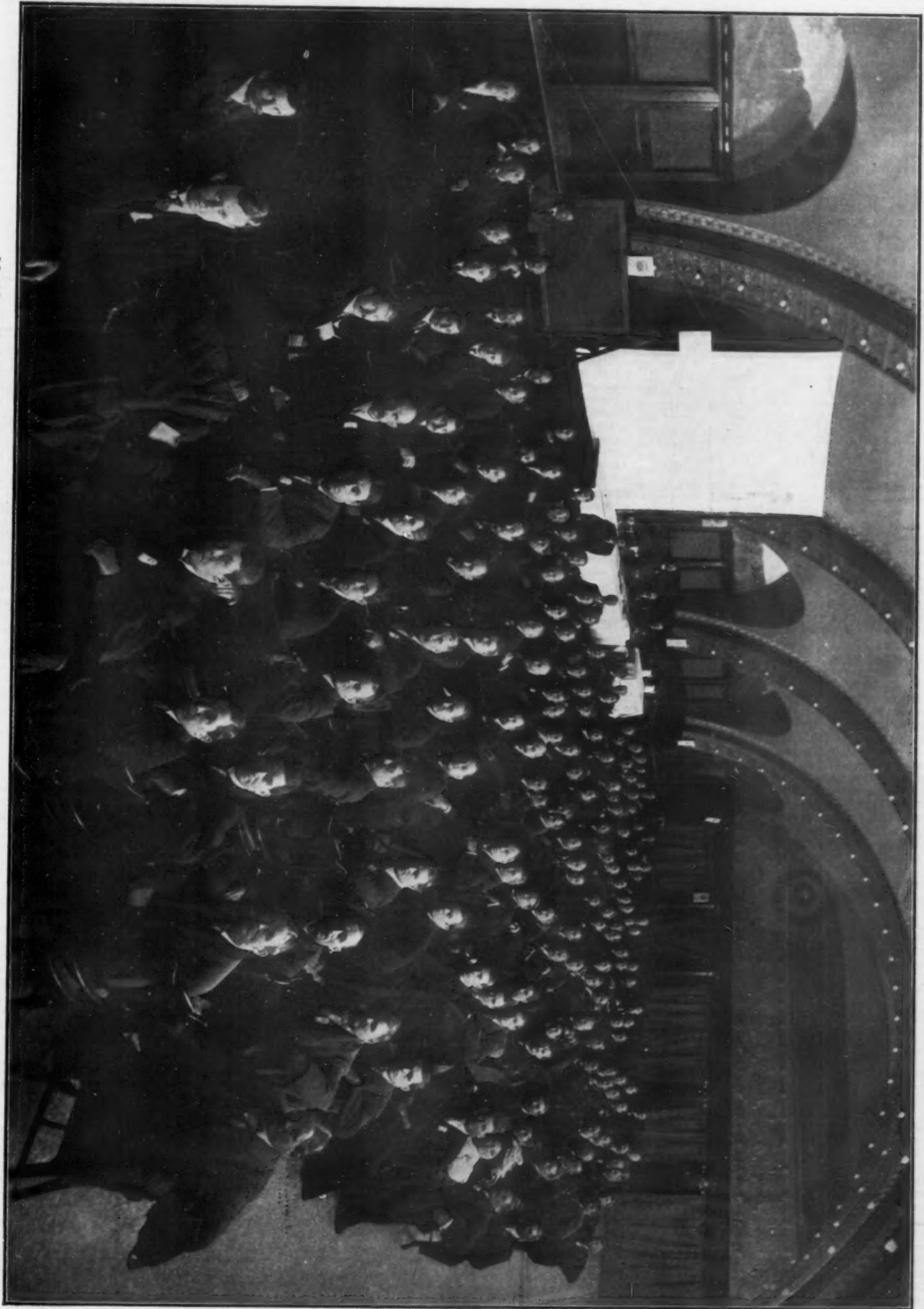
Durability.—Durability relates principally to the wearing surface; there is no reason why a cement slab should not wear longer than the ordinary natural stones; for in forming these slabs we have the advantage of selecting the toughest and strongest stones. Cement, itself, is tougher and stronger than most of the products of nature. The texture of the surface has a good deal to do with efficiency. A skum or skin of neat cement on the surface soon wears through, causing an ugly and blotchy pavement. There is no reason why a slab of cement stone can not be manufactured which would wear for a hundred or more years; it might wear down to the extent of half an inch, or an inch or more, and still preserve the same texture. This is perfectly feasible by making a slab of one piece, no top coat whatever, an even smooth top, carefully jointed, composed of small selected aggregates and in proportions which result in maximum density. I have seen one or two pavements of this character, notably the one around the Hotel Astor, New York, which is in 9-inch slabs, entirely around the building, expansion joints cut at regular intervals and so arranged as to form an architectural design. The concrete was composed of 3/4-inch traprock and sand. The surface was floated off and smoothed down with a trowel; it was not troweled to such an extent as to bring any neat cement to the surface. This pavement will wear for two hundred years or more, and as it wears down the same texture is preserved. The usual troweled surface is slippery. It does not wear, is subject to all manner of diseases, such as hair-cracks, crazing, peeling, etc., and is only beautiful before the disease sets in. A monolithic leveled off and smoothed to an even surface in which flint or quartz pebbles show through, such as some of our granolithic sidewalks, can be thoroughly tamped and then floated so that the above desirable results are economically obtained. Another method is to use 3/4-inch hard stone, quarry screenings or sand, making one slab at one time, straight edge off, tamp uniformly, smooth down to an even surface with float and trowel, cut joints, carefully mark joints with a good jointer, round the edges, and after final set is reached, but before the surface has begun to dry, scrub with a steel brush such as is used in cleaning boilers; play a hose on the surface just ahead of the brush and scrub the surface vigorously. This removes the neat cement from the exposed surfaces of all the aggregates, does not disturb the aggregates, and gives a most beautiful, natural and genuine finish, similar to natural granite, you therefore have a pavement which is honest and genuine clear through and is obviously so.

Neatness.—Neatness is obtained by the texture produced as described above, by carefully marking the joints and rounding edges. Be careful not to use too much water so that an excess water rises to the top, carrying with it particles of neat cement. This causes hair-cracks, crazing, streaks, and efflorescence. Another disease is occasioned by an accumulation of water in any one or more places which will cause what has been commonly known as water-cracks, which are not open cracks but surface cracks, which look like dark blotches. In discussing this subject of neatness, observation would indicate that the thought uppermost in the mind of most sidewalk paving contractors has been that of forming an artificial top of veneer over the rougher concrete. Do not use lamp black; it is the worst form of poor imitation. Sidewalk paving construction, like all other forms of engineering, is only permanently and lastingly good if honest and genuine. I will sum up these suggestions by endeavoring to frame a set of specifications, leaving out as much detail as possible, so that they may possibly be standardized, useful and, I trust, universal.

Cement Sidewalk Specifications.

Sidewalks in cold climates where frost occurs, should consist of a foundation of coarse cinder, broken stone, brick bats, or other porous material, extending below frost line, the concrete to be laid on this foundation. Do not lay concrete in freezing weather.

Drainage Foundation.—Excavate to a sufficient depth so as to get below the frost line, ram and tamp the ground thoroughly and evenly, fill in with clean cinders, broken stone, or brick bats, to within ... inches of top of the established grade



National Association of Cement Users in Session at Auditorium Hotel, Chicago.

of the pavement (a sufficient number of inches to provide for the thickness of slab necessary to give sufficient strength for the character of the work it is to perform); tamp this drainage foundation well and evenly, thoroughly wet the cinders, stone or broken brick, place in position wooden forms in a manner necessary to accurately outline the top and external edges of the walk, the top of the form being located so as to coincide with the established grade of the walk. As an additional precaution, and where necessary to accomplish the purposes of drainage, side drains should be placed every ten or twelve feet, having a fall of not less than $\frac{1}{4}$ inch to the foot leading to some point forming an outlet for water which may accumulate. This outlet should be below the frost line and may be accomplished by a hole filled with cinders, stone, or brick bats.

Concrete Base.—For a concrete base, spread . . . inches, number necessary to provide for the thickness of slab which will come to within 1 inch of the top of the established grade; this concrete to be composed of one part Portland cement and two and a half parts sand or quarry screenings, all passing $\frac{1}{4}$ inch mesh, and five parts broken stone or gravel, all passing 1 inch mesh.

These specifications may be regulated if proportions can be obtained which will allow of a larger proportion of broken stone, at the same time giving maximum density. Tamp the concrete to an even thickness, cut same into uniform squares of not over 6 feet square, using a steel cleaver of not less than $\frac{1}{4}$ inch and not over $\frac{1}{2}$ inch in diameter. Fill the joints thus formed with dry sand so that there is no possibility of the square blocks adhering together. Mark on the wooden forms the exact locations of these cuts. After each batch of concrete is laid as required, it shall be immediately covered with a top coat, or wearing surface, no dirt or dust having been allowed to accumulate on the base and the surface of the base to be wet or moist. Any portion of the foundation which has been left long enough to have the appearance of setting or hardening shall be taken up and relaid before the top coat is put on. Another method of separating the blocks is as follows:

Place a 2x3 inch strip (see diagram, letter D) parallel with sides of walk, in such position as will form square blocks, of equal dimensions, not over 6 feet wide; brace same with stakes but do not nail to frame, then cut a strip 2x3 inches, the length of which is to be the width of the blocks, or distance between strip D and side frame F. Place this strip so as to form a square block (see diagram, letter C). On inside of strips C and D place thick tar or felt paper $\frac{1}{4}$ inch thick and 3 inches wide; fill in the space thus formed (block A) with concrete composed of one part Portland cement, two and one-half parts sand and five parts crushed stone or gravel, mixed thoroughly. Tamp concrete thoroughly to an even thickness of 3 inches, then remove strip C; the tar paper will adhere to the concrete. Move strip C to the next position (see diagram dotted lines block B), place the thick tar or felt paper as before, and proceed the same with each block laying alternately. Put on top coat before the first block made starts to set or harden, and in regular order as blocks were made.

Top Surface.—For wearing surface, mix one part Portland cement with two parts crushed granite or other hard stone, all of which will pass through a quarter-inch mesh screen, or good coarse sand; mix by turning with shovels, raking with a garden rake as each shovel full is turned, turn twice dry and twice wet; add sufficient water to make a plastic consistency so that, when floated or troweled very little water rises to the surface. Spread this mortar over concrete base to a thickness of one inch. Work to a flat surface with a straight edge, smooth down with float and trowel after surface water has been absorbed; be careful to get an even surface, bringing no neat cement to the surface and avoiding float and trowel marks.

Cut top surface directly over cuts made in base; cut entirely through top and base all around each block. Finish joint thus made with a jointer and round or bevel all edges.

Monolithic Slab.—As an alternative, and instead of using a top coat, make one slab of selected aggregates for base and wearing surface, filling in between frames concrete flush with established grade. Concrete to be of selected aggregates, all of which will pass through a three-fourths-inch mesh sieve, hard, tough stones or pebbles graded, in size, proportioned to be one part cement, two and one-half parts crushed hard stone screenings or coarse sand, all passing a one-fourth-inch mesh,

and five parts crushed hard stone or pebbles, all passing through a three-fourths-inch mesh. Tamped to an even surface, prove surface with straight edge, smooth down with float or trowel, and in addition, a natural finish can be obtained by scrubbing with a wire brush while concrete is "green," but after final set.

Expansion.—Do not allow any block to bear directly against any solid body, such as stone curb, building, post, manhole rim, etc. Leave the same space (about one-fourth inch) between pavement and such fixtures as is between the blocks themselves. This applies to the base and top as designed to avoid cracks and chipping due to expansion and contraction from temperature changes. This space can be conveniently provided for by the use of thick tar paper or felt, waterproofed with any of the reliable waterproofed paints.

Protection and Seasoning.—Immediately as finished cover pavement so as to protect against rays of sun and drying, raising, covering a few inches so as not to come in contact with the surfaces after pavement has reached hard set, sprinkle frequently, two or three times a day, with a garden hose or sprinkler for a week or more.

In the discussion which followed the reading of this paper, the consensus of opinion was that a pavement laid in slabs of concrete, that is to say, blocks or slabs already cured before being laid, would seem to overcome the objection of contraction and expansion in cement sidewalks. With reference to fine sand, it was found that it is not so much the fineness of the sand that is detrimental, as it is the impurities that are found in fine sand. This would indicate that the best results are arrived at with the coarse sand, just as coarse aggregates in concrete give the best results.

TUESDAY EVENING SESSION.

The meeting opened at 8 p. m. with the president's address, which is printed herewith, and was accompanied by stereopticon views. Especially interesting were the views of concrete work at San Francisco full data and description of which were clearly and intelligently given by President Humphrey.

THE PRESIDENT'S ADDRESS. BY RICHARD L. HUMPHREY.

We are indeed in the age of cement and it is apparent that this infant industry which burst its swaddling clothes but a few years ago, has become a lusty youngster—its growth outstripping the dream of its most ardent supporters.

We are passing through an era of unparalleled prosperity which has occasioned an activity in the world of construction demanding enormous quantities of cement, this advancing the yearly consumption to figures which are a hundred fold greater than those of a dozen years ago.

When Germany, our principal competitor, topped a yearly production of 20,000,000 barrels, we regarded it as wonderful, yet a half dozen years later our own production has doubled these figures and we now are the largest cement producing country of the world.

It is hard for even the cement user to follow the meteoric progress of the production and consumption of cement. A progress so rapid that the friends of this material of construction must needs pause and consider the danger which may await a too rapid pace.

It was my pleasure a year ago to address this Association on the development of the industry and to indicate some of the uses to which cement was put. I shall utilize the time allotted for this address in pointing out the features of the great test—the San Francisco earthquake—which served to further establish some of its intrinsic qualities as a building material and to further point out some of the abuses to which it is subjected, which often result in failure of the structures in which it is used and which tends to retard the progressive development in its use.

As I took occasion to remark a year ago, cement has its weaknesses and limitations and these should be faced squarely by its advocates and pointed out emphatically, thereby preventing abuse which tends to dim its unsurpassed qualities.

Of the materials of construction cement is at once the most delicate and the most valuable—a plastic material, whose properties we are only just beginning to appreciate and understand.

Its extensive use is not because its qualities are well developed and recognized, but because its cheapness renders it an effective competitor of other building materials, both in strength and fire resisting qualities.

Great catastrophes and overwhelming disasters of all kinds, while resulting in great hardship and suffering, teach lessons of incalculable value. On the 18th of April of last year the entire civilized world stood aghast at the appalling destruction which visited the city of San Francisco and vicinity—the result of a slip of the earth's crust.

To the constructor and user of the materials of construction the most interesting feature was the behavior of the various materials of construction under those unusual and rigorous conditions. This was a test of such unusual violence that only the structure begotten of first class materials and design and honest workmanship could survive.

Fimsy and loosely erected structures were shaken to the earth and collapsed like houses of cards under the terrific wrenching and shaking of the earth.

Those structures which survived the earthquake test were, in many cases, subjected to a fire test exceeding in extent in its intensity all the great conflagrations of recent years.

Many structures which successfully withstood the first test failed signally under the test which followed by reason of the inadequate fireproofing. Other structures failed under both tests, while a very few withstood both tests successfully.

The study of the relative efficiency of the various materials of construction under these conditions is most interesting. It is a generally accepted fact that no structure can withstand the stress produced by the movement of the earth on the "fault line." The effect of the shaking and vibrations of the earth in the territory affected could be resisted, and the secret is proper design, first class materials and honest workmanship. In tall structures rigidity of construction and stiffness, the result of adequate wind and portal bracing is absolutely essential. While reinforced concrete structures in the zone of seismic disturbance were few, these passed the test in a highly satisfactory manner. Rigidity and stiffness and a high fire resistance which are inherent qualities of this material demonstrated how admirably they are suited to resist this extraordinary test.

This test seems to be greatest for structures built in low lands—on alluvial soil in the valleys of rivers—where the settlement of the earth under the earthquake vibrations was very great. On solid ground and rock formations the test was much less severe. Structures at points of great destruction such as Palo Alto, San Jose, Salinas, Santa Rosa, etc., were built on soft material as indicated. The buildings of Stanford University suffered severely, most of the buildings being wholly or partly destroyed by the earthquake shock. The types of construction represented was stone, brick and stone veneer and concrete—the latter not being reinforced except at the floor lines.

The buildings of the latter type passed the ordeal successfully and demonstrated the superior qualities of a material possessing great adhesive qualities.

The great concrete dam at Crystal Springs Reservoir gave additional proof of the substantial qualities of concrete for, although within a few hundred feet of the fault line, it suffered no damage.

At Palo Alto and Santa Rosa the failure of concrete block buildings have been pointed out as examples of the failure of cement to withstand the test. At Palo Alto three cement block buildings collapsed. No other result could have been expected when the method of construction is considered. The blocks were laid up without a tie of any kind and the floor joists and roof timbers either rested on or were built into wall without any tie.

Under the movement of the earth the walls were pushed out of line, the wooden members of the structure not being tied to the walls, there was no means of restoring the wall to its former position and it collapsed. In one of the buildings the gable end of the roof rested against the wall and served as a battering ram.

That such structures can be so built as to withstand earthquake shocks is evidenced by the building at Santa Rosa also built of cement blocks, but differing from those just referred to in that iron tie rods held the walls tightly to the floor joists and roof timbers. While the neighboring brick, stone and frame structures collapsed, this building was but slightly damaged along the cornice line. The destruction at this point was perhaps as great as that in any part of the territory affected by the

earthquake. At Mills College, just outside of Oakland, there were two structures of concrete, one a bell tower 80 feet high with 4-inch walls of reinforced concrete and the other a building with walls of concrete reinforced at the floor lines only. The former was not damaged in any way. The latter building being but slightly damaged by the collapse of the chimneys which crashed through the roof and floors.

Another reinforced concrete structure was the Cyclorama in Golden Gate Park, which demonstrated the futility of attempting to successfully provide against earthquake shocks where the foundation is bad and the material is poor. The walls of this structure rested on a foundation made by leveling off the top of Strawberry Hill; the aggregate of concrete consisted of a hard shale which made a very inferior concrete and a careful inspection of the ruined structure shows that little else could have been expected under the conditions. In San Francisco proper, in the fire zone, the behavior of concrete was equally satisfactory and there are many cases where concrete successfully passed both the strength and fire tests. There were but two structures of reinforced concrete, namely, the Belknap Van & Storage buildings and the Academy of Sciences. The former was in process of erection and had reached the second story, while the latter was an old structure. The walls of each structure were of brick and were cracked extensively by the earthquake, while the concrete remained undamaged, both structures being completely burned out, but the concrete was not damaged in the slightest degree. The columns in the Academy of Sciences building were cast iron, filled with concrete, and in one instance where the cast iron expanded and failed by cracking the concrete core remained unharmed.

Cinder concrete was most generally used for floor construction and behaved in an entirely satisfactory manner.

The failure of plaster, gypsum and terra cotta to protect steel against fire was most general. The utter inefficiency of commercial terra cotta was everywhere apparent, while cement or concrete properly applied on the other hand, was entirely adequate for the purpose. I believe that a terra cotta tile can be made which, when properly applied, will adequately protect steel structures, but it is not so made commercially today.

I think to the unbiased observer concrete gave sufficient evidence of its ability to resist both earthquakes and fire; its rigidity making it an admirable earthquake material, while its extremely low rate of conductivity for heat makes it a fire resistant of high order. The San Francisco earthquake, with the resultant conflagration, will be of inestimable value for the future constructor in furnishing reliable evidence of the value of the various classes of material, and the record is but another testimonial of the admirable properties of cement used.

Its strength and durability, its cheapness in comparison with other materials of construction places it in a position in which its future is absolutely secure. We are not fully conversant with its properties, its strong and weak points, and it behooves us to go slow and not be precipitate in its indiscriminate and reckless use.

The bold design in reinforced concrete, when taken in connection with the lack of a definite knowledge of some of the factors required in such a design, is venturesome to say the least.

Nor is this venturesome spirit confined to reinforced concrete alone. Plain concrete is used under conditions requiring reinforcement and building blocks are used for purposes to which they are utterly unsuited and under conditions which are dangerous.

Wherever failures occur, it is generally cement that has to bear the blame. And on this material all the sins of omission or commission are heaped, and yet it should be noted that it is extremely rare that failures are traceable to the quality of the cement used.

Where an unbiased examination is made, the failure is generally found to be due to bad workmanship, improper design, insufficient strength and a too early removal of the forms for the construction of all these, and many failures occur from improper material, insufficient mixing, improper consistency for effective tamping. In these days of machine mixing too little attention is given to the rigorous inspection of the process. As an illustration of this point I would state that on a large piece of work the system used in the mixing of the concrete was such that the sand was

thrown in by one man, the crushed stone by another and the cement by a third, the latter being called away from his post to perform his part, but during the interval the sand and stone went in with rhythmic precision. It is obvious what the effect of these batches of concrete would be and how fatally they would affect the strength of an important part of the structure. In another case which I have in mind the cement, sand and stone were fed automatically from hoppers so adjusted as to give the requisite proportion. At the time of this inspection the cement hopper had choked but the sand and stone were flowing on and the operator who was totally unaware of the fact, remarked, when his attention was called to it, that he thought the concrete looked rather peculiar. Perhaps the greatest source of failure is the strength of the forms; too little attention is given to the design of these forms and they are often made entirely too light for even normal conditions and where a temporary load in excess of that for which the structure was designed comes upon it the structure is either dangerously strained or collapses. I have in mind cases where excessive quantities of cement have been stored on the green concrete structure and in one instance producing a collapse of the floor panel. Concrete of improper quality is often used and I recently saw in New York cinder concrete consisting of one part of cement and five parts of cinders going into a reinforced concrete structure. Again the length of time which should elapse before the centering is removed has a marked bearing on the question of failures. The time required for concrete to harden sufficiently to permit the removal of the forms is naturally a variable one, depending on the design, the weather condition, and the strength of the concrete. A concrete with a small percentage of cement will require a longer time to acquire the requisite strength than a richer mixture; it will also take concrete longer to harden in cold than in warm weather and a beam of long span must be stronger than the one of short span before the form can be removed.

Another source of failure is the lack of attention to details especially as regards connections in the erection of a structure. The structure may be properly designed with the requisite amount of steel yet the structure may be fatally weakened by the character of the connections. A reinforced concrete structure should be practically a monolith—the tension members must be continuous in beams and columns.

It makes a material difference as to the length of the splice allowed in such columns or whether the splice in continuous beams is adequate.

I have in mind an instance which came to my notice of an enterprising laborer who observing the rod in a column projecting out of the concrete in the column of a several story building, seized a sledge hammer and drove the bar down flush with the surface of the concrete.

The remedy for all this is inspection, most careful inspection.

No more unstable material is in use to-day than cement. From the moment it is reduced to an impalpable powder it undergoes changes which seriously affect its quality. Unlike steel, wood, or smaller materials it does not stay tested and its quality must be ascertained before use.

When we consider the way in which so delicate a material is handled by unskilled laborers it is not surprising that failures should occur.

A steel beam or channel is fabricated at the mill and undergoes during the process of manufacture a most rigid and careful inspection and in the erection again undergoes careful inspection. On the other hand a concrete structure is fabricated on the site and is subject to little, or at the best, indifferent inspection and the unintelligent laborer contributes to the abuse.

The same careful and rigid inspection should be given the erection of a concrete structure as a steel structure receives and until this is done we may expect failures.

The comparatively few failures in concrete structures are allowed to overshadow the great number of excellent examples of well designed constructions of this class. And it should be noted that what failures there are, occur during the process of erection and are almost invariably due to a too early removal of the forms or bad workmanship.

The failure of a structure of concrete by reason of improper design, bad workmanship or poor materials no more affects the value of concrete for constructive purposes than the failure of a structure

of steel due to similar conditions should condemn steel for structural purposes.

We may expect failures as long as incompetent men will undertake to design structures in concrete and unskilled and ignorant persons will attempt to "skin" the work for the purpose of increasing their profits; and it will only be the continual loss of life that results from these failures that will bring the authorities to such a realization of their responsibilities as will result in laws which will properly safeguard the public.

Amid the ignorance and wonder that attends the use of new material the charlatan practices his art unchecked, new forms of patented construction are constantly springing into existence, many absolutely devoid of merit and the public are being proportionately humbugged and deceived.

Plans and specifications are generally prepared by the contractor and for every skilled competent contractor, there are many who are incompetent who do not hesitate to skin the work in order that they may finish it without loss of profit, having taken it at a figure entirely too low to admit of proper workmanship with first-class materials.

Such practices are wholly unnecessary for first-class legitimate construction can successfully compete with other forms of construction and there are many reliable concerns capable of executing such work.

Owners, architects and engineers are criminally responsible where they award work to irresponsible contractors lacking in the requisite experience and knowledge for safe construction, or who permit structures to be erected under the direction of competent persons who do not give the work their personal supervision.

Where the charlatan reaps his greatest harvest is through the medium of the beguiling literature giving strength values, based on tests, primarily made for the purpose of developing and exploiting the strongest features of the system for which he holds the patent.

Many concerns rush in with inadequate experience, acquiring this at the expense of their clients.

The present condition of the art of concrete or reinforced concrete condition is not unlike the condition of the iron business in its early history, not so many years ago.

The knowledge relating to the construction of highway bridges was at that time largely vested in the contractor and it was the practice for the contractor to submit bids for bridges based on his own plans and specifications and the number of failures of highways was directly attributable to this fact, and it finally drove the constructor into making his own designs and specifications, with the result that the contractor bid much more closely and intelligently on a definite plan and specifications, and failures in such structures became a thing of the past.

This experience, I believe, will be repeated in the case of structures of cement. In the meanwhile a knowledge of the properties of concrete is more fully established, its strong and weak points more thoroughly understood; it behooves us to go slow and be more conservative and careful in its use. The failures which occur from time to time unquestionably hinder the development of the industry in that they cast doubt upon a comparatively new material and make builders cautious in its use.

I would repeat that we should recognize the weak points of cement and further see to it that its good points are not abused.

It will only be by determined action that the present abuses can be curbed and the fair name of concrete preserved.

It is the duty of every user of this material, of every friend to join most heartily in the cause. Let each of us put our shoulder to the wheel, thereby controlling this rapid movement in the application of cement to constructive use lest they get away from us and run on to destruction. We should not be afraid to state the truth, even though it hurts; we should by all means be honest, and not hold malice toward those who frankly call our attention to the few weaknesses in the most magnificent building material at the command of the constructor.

Professor W. K. Hatt's paper on "Reinforced Concrete" was worded in clear, intelligible phrases with a noticeable elimination of technical phrases, and his diagrams and physical explanations on the blackboard were of great value to the large and enthusiastic audience present.

REINFORCED CONCRETE.

BY W. K. FATT.

It was the comfortable assurance of that urbane Roman poet, Horace, that he had built himself a monument more lasting than brass in the intellectual life of mankind. At the time that he was writing these lines the Roman engineers were constructing these concrete aqueducts and domes that have served mankind on the physical side during the time that Horace has been a source of perpetual delight to the students of classical writings. Which product will endure the longer is an open question. One thing is certain, while many persons of exquisite taste may prefer Horace to our modern writers, most well informed persons conclude that the engineer of to-day has surpassed the Roman engineer in the quality and use of concrete.

The number of recent failures of reinforced concrete buildings, attended with the loss of life of workmen, does not constitute an argument against the advance of the practice of this new art, but calls attention to the need of correct theory in design and expert supervision in construction. Steel for buildings is made under highly technical methods and a searching inspection by trained men, whereas concrete for buildings may be formed by ignorant and unskilled workmen and may be supervised by foremen who are inexperienced in the art of proportioning and mixing the ingredients. Defective material, either of cement, sand or stone, dishonest skimping of cement and poor inspection, incorrect proportioning, and a too early removal of the wooden forms from the floors moulded in cold weather, or heavily laden with stored cement and other materials, are sufficient causes to explain these failures. An increasing number of these may be expected as time goes on and untrained men who have learned their business in other lines of construction take up the work of building reinforced concrete structures. The resulting loss of life will no doubt call attention to the necessity of regulating by proper building laws this new construction, which has spread so rapidly, over the country from sea to sea. In 1902, when the first published results of experimentation appeared from the laboratory for testing materials of Purdue University, one had to go far to observe instances of reinforced concrete. Last summer in Seattle the writer saw no other type of building in process of construction. At Atlantic City in 1902, when the experiments referred to were placed before the American Society for Testing Materials, there were no instances of the use of reinforced concrete in sight. Last summer at the meeting of the society one viewed the stately and beautiful Marlborough-Blenheim Hotel entirely constructed of reinforced concrete; the replacement of the steel pier by reinforced concrete piles and girders; and the construction of a new recreation pier of this type of construction. The growth has been truly marvelous. Not only has the extent of its use in bridges and buildings increased, but the variety of its application is extraordinary. In a list of constructions in which it is successfully and economically used may be included: Retaining walls, dams, tanks, conduits, chimneys, arches, culverts, foundations, floors for buildings, railroad girders, highway bridges, pipes, railway ties, piles, stairs and roofs.

At the present time the underlying mechanical principles and the constants of design of beams are fairly well determined, and we wait upon the architects to express the truth of these principles in a beautiful structure. While this type of construction associates itself with the broad and simple wall spaces and low buildings of the Spanish Mission style, with surface ornaments of tiling and mosaic, it also lends itself to important modern civic buildings. The stateliness of beauty of the Marlborough-Blenheim Hotel at Atlantic City has been mentioned. The Ingalls Building, Cincinnati, and the New Terminal Station at Atlanta, Ga., are other examples.

Without stopping to discuss the properties of waterproofness, fireproofness, durability, etc., or the multitude of topics of interest and importance that crowd upon one's mind in connection with reinforced concrete, attention will be simply called to the mechanical principles underlying the construction.

Concrete, like stone, is weak in tension, but strong in compression at a ratio of 1 to 10. Consequently when under flexure, as in a beam, the concrete is not used economically; for it breaks on the lower side in tension before the compressional strength is utilized. A beam may be, however, strengthened, or reinforced, by the insertion of a steel rod in the lower side of the beam. These rods are usually bent up near the ends of the

beam so as to also reinforce the beam against the diagonal tensional stresses that occur at the ends, due to the combination of shear and direct stress.

Before the rod can come into operation during a flexure of the beam, there must be the necessary adhesion between the concrete and the rod to transfer the stress to the rod. This adhesion or bond varies from 200 pounds to 500 pounds per square inch of the surface of a plain rod, and under favorable conditions is sufficient to develop the strength of the steel in the concrete. The adhesion is thought to be more of a mechanical action than chemical, and is due to the entrance of the fine cement into the microscopic pits on the surface of the smooth rods. Many designers use artificially deformed bars, such as corrugated bars and twisted steel bars to increase this adhesion.

Some engineers have feared the effect of long continued vibrations on the bond of the steel or the strength of the concrete.

It is well known that concrete, because of its lack of elasticity, absorbs or deadens vibrations, and the sound caused thereby. It is not probable that vibrations reach the steel. The speaker has knowledge of many experimental attempts to loosen the bond by shocks and vibrations. So far smooth bars incased in concrete that have been subjected to shocks and long continued vibrations seem not to have lost any of their original strength of bond. Likewise the concrete on the compression side of a reinforced concrete beam that has been loaded and released from load some 2,500 times to high working stresses seems not to have been substantially weakened thereby.

In this way a beam is reinforced so that both the concrete in compression and the steel in tension may be worked to their full value. Any one who has seen a plain concrete beam broken in a testing machine, and then has witnessed a test of a reinforced concrete beam will be first of all struck by the apparently greatly increased flexibility of the reinforced concrete beam which deflects ten times as much as the plain beam before showing, in the case of a dry beam, any cracks to the naked eye, and when the load is removed the elasticity of the steel draws the beam back nearly to its original shape. It is probable, however, that this process of bending the reinforced concrete beam develops very minute flaws in the concrete which are invisible to the naked eye, unless the concrete has been soaked in water, so that it is not safe to count upon a tensile strength of the concrete in computing the total resisting strength of the beam at the usual working stresses. Small fissures are no doubt present in the concrete before the stress is applied. Designers usually compute the resisting moment of the beam as based upon the compressional stresses in the concrete and the tensional stress in the steel alone.

Engineers as a rule have found it necessary to

review their knowledge of mechanics in dealing with reinforced concrete, not that there is any new principle involved, but the number of factors in the equations of flexure is greater, and an account must be taken of the relative moduli of elasticity of the two materials, steel and concrete. Furthermore, the lack of perfect elasticity of the concrete under certain conditions leads to an assumption of some other than a rectilinear relation between stress and strain.

In calculating the strength of the reinforced concrete beam, sufficiently approximate results can be obtained by omitting consideration of the tensile stresses in the concrete, and supposing a rectilinear relation between stress and strain. The moment of flexure is then most simply expressed as the total force in the steel multiplied by the distance to the centroid of the compressive stresses. This latter distance is expressed with sufficient accuracy as a fraction of the depth of the beam, this fraction having been determined by experimental measurement on the tested beams.

Care in all cases must be taken to compute the maximum compressive stress arising in the concrete under the conditions of the problem, and also the amount of diagonal tension at the ends of the beams must be computed and provided for by stirrups, or by bending up some of the rods at the ends.

The simple methods of computation recommended by Professor Talbot seem to the speaker to be conservative and clear. Professor Talbot's experiments have served the purpose of fixing the principles of action of a reinforced concrete beam. It is a matter of congratulation that the extensive facilities for testing reinforced concrete in various forms in the University of Illinois are directed by one who has shown such a firm grasp of the problem, and can direct the experiments to a solution of problems of essential importance.

The question of lumber for forms in reinforced concrete construction is one of increasing importance. The scarcity of lumber is reflected in the increasing price. This is not a temporary condition, but is justified by the economic conditions. It is a well known fact that the forest resources are rapidly becoming depleted, and that we are rapidly approaching the time when we shall feel the pinch of a timber famine. Even at the present time the lumber cost for forms in reinforced concrete construction is a considerable item. The progress of design will be largely in the direction of casting the materials in permanent forms and then erecting them, and of so designing the building and centering that these may be simple and inexpensive, and that the sequence of operations will result in the use of as little lumber as is necessary. The organization of the United States which has given a large amount of attention to the study of the supply of timber and the methods



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of preparing it for the market, and its value for structural purposes, is the Forest Service of the United States Department of Agriculture. Members of this association who wish information concerning our timber supplies and their quality, will do well to apply for the publications of the Forest Service. They can be had by addressing the Forester, Forest Service, U. S. Department of Agriculture.

To conclude this brief consideration of reinforced concrete, a conservative estimate would include the following principles:

1. Concrete is durable and fireproof when made of the proper aggregate.

2. The strength of combinations of steel and concrete may be calculated with a sufficiently close degree of accuracy.

3. Shapely and beautiful structures may be built of this material. It is particularly adapted for mill buildings because of the absence of vibrations which are induced in the ordinary type of mill buildings by the rapidly revolving machinery.

4. The cost of a properly designed reinforced concrete building, where wooden forms are used to advantage, is said not to exceed more than 5 or 10 per cent of the cost of mill buildings of the ordinary type with brick walls and wooden beams of the so-called slow-burning construction, provided that the concrete may be laid as at present by unskilled labor.

The paper of Sanford E. Thompson, on "Forms for Concrete Construction," which will be published in a future issue, was replete with illustrations, and at its conclusion was roundly applauded. In the discussion of the paper, while several members spoke of the success attained with concrete during freezing weather, President Humphrey was emphatic in declaring that concrete in any construction, should not be permitted to freeze or to approach freezing before arriving at its final set; that such freezing would naturally arrest the crystallization or chemical action of the cement, and would certainly act to the detriment of the ultimate strength of the mass.

WEDNESDAY MORNING SESSION.

During the discussion of the meeting of section on "Concrete Blocks and Cement Products" which started in session at 9 o'clock sharp, many experiences were given as to the arriving at uniformity of color in the blocks, and to this end, it was found that steam curing helped materially, as did also the use of water-proofing in the mix.

Wm. B. Fuller, consulting engineer, New York City, was not present, but his paper was read by Mr. Curtis, the secretary, and appears in full in this issue, under the head of "Simple Tests for Determining Value of Materials for use in Mortar and Concrete."

The paper brought out clearly the economies of concrete, and the results arrived at with different proportions, thus leaving it to the cement user to determine by actual experiments as to just which of the various proportions cited would be the best and at the same time the most economical for the work in mind.

SELECTING THE PROPORTIONS FOR CONCRETE.

BY WILLIAM B. FULLER.

The growing use of concrete for structures in which great care must be taken to have only the best material and workmanship, has stimulated investigations into the effect of varying the relative proportions of sand and stone in the mix, the proportion of cement to the total remaining the same, and the result has demonstrated very conclusively that the proper grading and relative proportion of the ingredients has a great influence on the quality of the concrete produced. To demonstrate this great effect, the writer at one time made up a set of beams 6 inches square and 6 feet long, varying these relations very widely from almost all stone to almost all sand, and broke the beams after 30 days with the following results:

Proportions.	Modulus of Rupture.
	Lbs sq. in.
1 : 2 : 6	319
1 : 3 : 5	285
1 : 4 : 4	209
1 : 5 : 3	151
1 : 6 : 2	102
1 : 8 : 0	41

By inspecting the above table it is seen that although the amount of cement in each of the above beams was the same (namely 1-9 of the total ma-

terial), some of the beams were over 700 per cent stronger than others.

In investigating this subject over a term of years, it has been found that there is one combination of any given sand and stone which with a given percentage of cement makes the strongest concrete and this is the proportion which also gives the densest concrete, that is, the concrete which contains the least percentage of voids, or otherwise, that which weighs most per cubic foot.

It is found also that this dense concrete is least permeable to water and consequently is the most durable, and it is also found that as a practical advantage such concrete is most easy to place, working "slick" and filling up all voids and bad corners.

The above stated law that the densest concrete is also the strongest, gives a very easy way of proportioning the materials at hand so as to obtain the best and strongest concrete possible with these given materials. That is, to obtain these proportions by trial, as follows:

Procure a piece of steel pipe 8 to 12 inches in diameter and about a foot long and close off one end, also obtain an accurate weighing scale. Weigh out any proportions selected at random, of cement, sand and stone, and of such quantity as will fill the pipe about three-quarters full, and mix thoroughly with water on an impervious platform, such as a sheet of iron; then, standing the pipe on end, put all the concrete in the pipe, tamping it thoroughly, and when all is in measure and record the depth of the concrete in the pipe. Now throw this concrete away, clean the pipe and tools and make up another batch with the total weight of cement, sand and stone the same as before but with the proportions of the sand to the stone slightly different. Mix and place as before and measure and record the depth in the pipe, and if the depth in the pipe is less and the concrete still looks nice and works well, this is a better mixture than the first. Continue trying in this way until the proportion has been found which will give the least depth in the pipe. This simply shows that the same amount of material is being compacted into a smaller space and that consequently the concrete is more dense. Of course, exactly similar materials must be used as are to be used on the work, and after having in this way decided on the proportions to be used on the work it is desirable to make such trials several times while the work is in progress, to be sure there is no great change in materials, or, if there is any change, to determine the corresponding change in the proportions.

The above described method of obtaining proportions does not take very much time, is not difficult, and a little trouble taken in this way will often be productive of very important results over the guess method of deciding proportions so universally prevalent. I have repeatedly known concrete to be increased in strength fully 100 per cent by simply changing the proportions of sand to stone as indicated by the above method and not changing the amount of cement used in the least.

A person interested in this method of proportioning will find on trial that other sands and stones available in the vicinity will give other depths in the pipe and it is probable that by looking around and obtaining the best available materials the strength of the concrete obtainable will be very materially increased.

As a guide to obtaining the best concrete, the proportion of cement remaining the same, the following are the results of extensive tests:

The stone should all be of one size or should be evenly graded from fine to coarse, as an excessive amount of the fine or middle sizes is very harmful to strength.

All of the fine material smaller in diameter than one-tenth of the diameter of the largest stone should be screened out from the stone.

The diameter of the largest grains of sand should not exceed one-tenth of the diameter of the largest stone.

The coarser the stone used the coarser the sand must be, and the stronger, more dense and watertight the properly proportioned work becomes.

When small stones are only used the sand must be fine and a larger proportion of cement must be used to obtain equal strength.

The report of the Committee on Testing Cement and Cement Products, E. S. Larned, chairman, also appears in full in this issue, and bears evidence of care and attention in its preparation.

While the curing of blocks by steam has its advantages, it also has its dangers. If the block is placed in steam before the cement has had a chance to set, the heat of steam will check the

hardening and the block will be made weaker. If, on the other hand, the block is made up in the ordinary way and is allowed to set and is then placed in the chamber, the heat will accelerate the chemical actions which are taking place and the block will be much better; but too much care can not be exercised in practically determining the best time at which to place the blocks in the steam.

Mr. Larned called particular attention to the use of the expression, "run of the crusher," in the specifying of concrete aggregates, and the absolute necessity for gauging all materials entering into the mass.

REPORT OF COMMITTEE ON TESTS OF CEMENT AND CEMENT PRODUCTS.

BY E. S. LARNED, C. E., CHAIRMAN.

The section of this association having in charge the subject of "Testing of Cement and Cement Products," are of the unanimous opinion that the association should adopt prompt, progressive and aggressive measures to encourage, protect and promote the more intelligent use of cement in all forms of construction.

This organization has, even during its brief existence, assumed national importance, and in the breadth and scope of its work can be and should be of even greater benefit to the professions, building trades, manufacturers, resident owners and all others interested in public or private projects in which cement plays a part.

The advantages of standardization and classification are well known, and while it may not be possible, in the rapid development of this industry, to fix, at this time, rigid specifications covering all the ramifications of our work, yet we must recognize certain fundamental principles that are now well established, governing the action of cement under different conditions of use, and should establish requirements that will prevent its misuse and abuse.

For the proper and successful development of the cement industry, it is necessary to create universal confidence in its use and avoid the deterring influence of failures of whatever cause. To this end we must educate not only ourselves, but others, and the value of training and experience can not be over-estimated. The public demand for cement construction can not be met to-day because of lack, not only of contractors and men experienced in this work, but of architects and engineers as well.

Recommendations.

(1) *Reinforced Concrete*—The joint committee of the American Society of C. E., American Society for Testing Materials, American Institute of Architects, have the question of standard requirements and tests of this form of construction under advisement at this time, and we recommend that this organization await the report of this joint committee before taking action upon this most important branch of the cement industry. In advance of this report, however, we do recommend that it be declared the sense of this organization that all cement used in reinforced concrete construction should be high grade Portland cement, meeting all the requirements and tests of the American Society for Testing Materials, and further, that all cement for such uses shall be tested by a competent person at the works or immediately upon delivery by the railroad, and accepted or rejected in advance of its use, or incorporation with other materials.

(2) We recommend the appointment of a Specification Committee, consisting of the president of this association, ex officio, the vice president and members of the section on "Tests of Cement and Cement Products," and the vice presidents of each of the following named sections, viz: Concrete Blocks and Cement Products, Streets, Sidewalks, and Floors, Reinforced Concrete, Art and Architecture, Machinery for Cement Users, Fire-proofing and Insurance, Laws and Ordinances. The above committee to meet and organize before the close of this convention and copy of their report and recommendations to be prepared and sent to each member of this association on or before the first day of June, 1907, for consideration in advance of the next annual convention.

(3) *Cement Building Blocks*—No other department of the cement industry has so felt the need of standard specifications and uniform instructions as we find in the manufacture of cement blocks. There is, to-day, a large and growing demand for this material, and its general and almost unlimited use is only retarded by lack of confidence on the part of builders and resident owners who see only the wretched results that often attend the efforts of the misinformed and

inexperienced and overlook the splendid possibilities of this construction in the hands of skilled and experienced operators.

In advance of a standard specification to be adopted by this association, we beg to emphasize herein a few points and urge their adoption at this time as the sense of the association.

(3a) **Cement**—Only a true high grade Portland cement, meeting the requirements and tests of the Standard Specifications of the American Society for Testing Materials shall be used in the manufacture of cement blocks for building construction. (We recommend a reprint of the standard specifications in the published proceedings of this convention.)

(3b) **Unit of Measurement**—The barrel of Portland cement shall weigh 380 pounds net, either in barrels or subdivisions thereof, made of cloth or paper bags, and a cubic foot of cement, packed as received from the manufacturer, shall be called 100 pounds or the equivalent of 3.8 cubic feet per barrel. Cement shall be gauged or measured either in the original package as received from the manufacturer, or may be weighed and so proportioned, but under no circumstances shall it be measured loose in bulk for the reason that when so measured it increases in volume from 20 to 33 per cent, resulting in a deficiency of cement.

(3c) **Proportions**—Owing to the different values of natural sand or fine crusher screenings for use in mortar mixtures, due not only to its mean effective size, but also to its physical characteristics, it is difficult to do more in a general specification than fix the maximum proportions of good sand that may be added to cement.

(3d) **Sand**—Or the fine aggregate shall be suitable, siliceous material passing the $\frac{1}{4}$ inch mesh sieve and containing not over 10 per cent of clean, unobjectionable material passing the No. 100 sieve. A marked difference will be found in the value of different sands for use in cement mortar. This is influenced by the form, size and relative roughness of the surfaces of the sand grains and the impurities, if any, contained. Only clean, sharp and gritty sand, graduated in size from fine to coarse, and free from impurities, can be depended upon for the best results. Soil, earth, clay and fine "dead" sand are injurious to sand and at times extremely dangerous, particularly in dry or semi-wet mortars, and they also materially retard the hardening of the cement. An unknown or doubtful sand should be carefully tested before use to determine its value as a mortar ingredient. Screenings from crushed trap rock, granite, hard limestone and gravel stones are generally better than bank sand, river sand or beach sand in Portland cement mortars; (but not so when used with natural cement, unless the very fine material be excluded).

So called clean, but very fine sand has caused much trouble in cement work and should always be avoided, or, if impossible to obtain better, the proportion of cement should be increased. Stone screenings and sharp, coarse sand may be mixed with good results and this mixture offers some advantages, particularly in making sand-cement blocks.

(3e) **For Foundations**, or superstructure walls exposed to weather, carrying not over five tons per square foot, the maximum proportion shall not exceed four parts sand to one part cement. This proportion, however, requires extreme care in mixing, for uniform strength, and will not produce water-tight blocks. We recommend for general work not over three parts sand, if well graded, to one part cement, and the further addition of from two to four parts of clean gravel stones passing the $\frac{3}{4}$ inch mesh sieve, and retained on a $\frac{1}{4}$ inch mesh sieve, or clean, screened, broken stone of the same sizes. These proportions with proper materials and due care in making and curing, will produce blocks capable of offering a resistance to crushing of from 1,500 to 2,500 pounds per square inch at twenty-eight days. (For the best fireproof qualities limestone screenings or broken sizes should be excluded, but otherwise are all right for use.)

Where greater strength is desired, particularly at short periods from two to six weeks, we recommend proportions of 1 part cement, 2 parts sand, and from $1\frac{1}{2}$ to 3 parts gravel or broken stone of sizes above given. Blocks made of cement, sand and stone are stronger, denser and consequently more waterproof than if made of cement and sand only and are more economical in the quantity of cement used.

(3f) **Mixing**—The importance of an intimate and thorough mix can not be over-estimated. The

sand and cement should first be perfectly mixed dry and the water added carefully and slowly in proper proportions and thoroughly worked into and throughout the resultant mortar; the moistened gravel or broken stone may then be added, either by spreading same uniformly over the mortar or by spreading the mortar uniformly over the stones, and then the whole mass shall be vigorously mixed together until the coarse aggregate is thoroughly incorporated with and distributed throughout the mortar.

We recommend mechanical mixing whenever possible, but believe in the thorough mixing of cement and sand dry before the addition of water, this insures a better distribution of the cement throughout the sand, particularly for mortar used in machine made blocks of a semi-wet consistency. For fine materials, such as used in cement blocks, it is necessary that the mechanical mixer be provided with knives, blades or other contrivances to thoroughly break up the mass, vigorously mix the same, and prevent balling or caking.

(3g) **Curing**—This is a most important step in the process of manufacture, second only to the proportioning, mixing and moulding, and if not properly done will result either in great injury to or complete ruin of the blocks. Blocks shall be kept moist by thorough and frequent sprinkling, or other suitable methods, under cover, protected from dry heat or wind currents for at least seven days (preferably two weeks). After removal from the curing shed, they shall be handled with extreme care, and at intervals of one or two days shall be thoroughly wet by hose sprinkling or other convenient methods. We recommend curing in an atmosphere thoroughly impregnated with steam. This method serves to supply needed moisture, prevent evaporation, and in some measure accelerates the hardening of the blocks.

We view with distrust, in the present knowledge of the chemistry of cement, any artificial, patented or mysterious methods of effecting the quick hardening of cement blocks or other cement products. If such method be proposed, it should be thoroughly investigated by competent authority before use.

(a) **Time of Curing**—This is also most important in its effect upon the industry and is directly and vitally influenced by the following conditions:

- (1) Quality, quantity and setting properties of the cement used.
- (2) Quality, size and quantity of the sand or fine aggregate used.
- (3) Amount and temperature of water used.
- (4) Degree of thoroughness with which the mixture is made.
- (5) Method of curing, weather conditions and temperature.
- (6) Density of the block as effected by the method and thoroughness of tamping or pressure applied.

Before fixing the minimum permissible time required in curing blocks, we wish to emphasize the important effect of additions of sand upon the tensile strength of cement mortar. In doing so, we will refer to an experiment made at the Holyoke Dam, Mass., to determine the tensile strength at 28 days of a high grade Portland cement mixed with different proportions of sand, the briquettes being kept in water (after 24 hours) until broken.

28 Day—Tensile Test.

Sand to Cement	lbs. per sq. inch.	Ratio.	Sand to Cement	lbs. per sq. inch.	Ratio.
Neat Cement	889	100	5 to 1	133	16
1 to 1	805	90	6 to 1	121	14
2 to 1	589	66	7 to 1	71	8
3 to 1	343	39	8 to 1	53	6
4 to 1	204	23	9 to 1	44	5

These great differences would be more marked at periods less than one month, and not quite so marked at longer periods. At 23 days, however, it is apparent that the 4 to 1 mixture has only 35 per cent of the strength of a 2 to 1 mixture, and but 59 per cent of the strength of a 3 to 1 mixture, while the 5 to 1 mixture has but 39 per cent of the strength of the 3 to 1 combination, and only 65 per cent of the strength of the 4 to 1 mixture, and but 23 per cent of the strength of the 2 to 1 mixture. The ratio of compressive strength to tensile strength is not quite constant for all periods of time and for the several mixtures above given, but the compressive strength or resistance to crushing per square inch may be approximately obtained by multiplying the tensile strength given in the above table by the constant six (6). (See remarks.)

Recommendations—If blocks be made of approved materials and under approved conditions, we recommend the following as the minimum period

of time after their manufacture, at or after which the blocks may be used in building construction.

Curing of Blocks.

Mortar composition.	Time required for curing before use.
1 cement to 1 sand.....	14 days
1 cement to 2 sand.....	21 days
1 cement to 3 sand.....	28 days
1 cement to 4 sand.....	45 days
1 cement to 5 sand.....	(see notes) 90 days

NOTE—This mixture is not recommended, but is given to show the increase in time required for so lean a mixture to gain the strength required by leading specifications now in force.

We believe it is wrong in principle to fix a uniform period for curing or aging, without due regard to the proportions used. It is manifestly unfair to require as long a period for a 2 to 1 or a 3 to 1 block as for a 4 to 1 or 5 to 1 block; and it is obviously unsafe to attempt to use a block of lean proportions in as short a time as a rich mixture would gain the necessary strength. This might be supposed to be met by fixing the minimum resistance to crushing of blocks (of all composition), but it must be kept in mind that a very small percentage of the blocks used are tested, by reason of the expense, inconvenience or lack of facilities or time.

Marking—All cement blocks shall be stamped (in process of making) showing name of manufacturer, date (day, month and year) made and composition or proportions used.

Requirements—We believe that architects and engineers or builders and other purchasers of blocks should be encouraged to require and give preference to blocks made under the standard specifications of the National Association of Cement Users.

Tests—Blocks may be subjected to any one or all of the following tests, viz: Transverse, Compression, Absorption, Freezing and Fire. These tests should be made in some laboratory of recognized standing, and we recommend uniform instructions for conducting such tests.

We also recommend the use of uniform report cards or forms showing results of tests made.

Licenses—We recommend the granting of a license to intending manufacturers of blocks, said license to be revocable for the following causes, to-wit:

- (1) Willful violation of specifications, laws and ordinances.
- (2) Dishonest methods.
- (3) Use of improper materials, the quality of same if in question, to be determined in a disinterested laboratory of recognized standing, but also subject to verification, if desired by either party at issue.

Sidewalks and Pavements.

We recommend that the National Association of Cement Users urge and encourage in every way feasible, the adoption, by all municipalities, of standard specifications and uniform instructions covering the construction of all pavements and sidewalks in or on public ways, and insist that same be observed, whether the work be done by public or private appropriations.

This provision has special reference to the preparation, depth and character of foundations, curbing, and pitch or grade of pavement, also the marking, jointing and quality of materials used in construction. Due attention shall also be given to the protective measures necessary to prevent injury to work, in course of construction or newly completed, by reasons of weather conditions, heat and cold, or too early use.

S. B. Newberry's ideas on the subject of steam curing for blocks were fully expressed in a concise manner. The subject was one which still required deep thought and careful study, and the whole game seemed to be that of a time saver. Time might be saved in the making of small blocks, but it was a question where large blocks were made as to whether the installation of steaming apparatus and the extra handling would offset the time saved and the general dependability of the finished block.

The report of the executive committee read by President Humphrey showed that as of January 1, 1907, there was \$890.69 in the treasury as against a balance of \$160.93 on January 1, 1906; that the membership had increased from 161 at the Indianapolis convention, to 218 at the Milwaukee convention, with all indications to a still further increase at this meeting. Minutes of meetings of the executive committee held subsequent to the Milwaukee convention were read, and mention made of

the \$300.00 honorarium to C. C. Brown, the former secretary of the association. The report was unanimously approved.

On motion a resolution of thanks was tendered the president and the officers of the association for the able and efficient manner in which the affairs of the association had been conducted and also covering an honorarium of \$300.00 to Richard L. Humphrey as an expression of appreciation of the able work done by him.

It was also resolved that the time and place for the next convention be left to the executive committee, with power to act.

The following officers were elected to serve the ensuing year: Richard L. Humphrey, president; Merrill Watson, first vice president; M. S. Daniels, second vice president; O. U. Miracle, third vice president; A. Monsted, fourth vice president; the choice of secretary and treasurer being left to the executive committee.

WEDNESDAY EVENING SESSION.

Both the papers of William L. Price on "The Architectural Possibilities of Concrete," and A. O. Elzner on "Use of Concrete from an Architect's Standpoint," evidenced the interest which architects are taking in concrete and its workings, and these interesting papers will appear in a future number of the paper.

The paper of H. H. Quimby on "Finish for Concrete Surfaces," which appears in full is complete, concise and intelligent, showing concrete as it is and should be, without any attempt to imitate any other material.

CONCRETE SURFACES.

HENRY H. QUIMBY, M. AM. S. C. E.

The ordinary concrete structure—whether of building blocks or monolithic masonry and whether as left by the forms or as commonly finished for exposure to view—is anything but pleasing in appearance, and this fact seems to be the principal reason for the disfavor with which some architects and engineers regard concrete as a material for construction.

The blocks usually have a bubbly, artificial-appearing surface subject to a discoloration that is generally of a sickly or lifeless hue, which offends the eye quite apart from the unpleasant effect of the machine like regularity of such blocks as are made in imitation of rock-face ashlar. Monolithic concrete is usually finished either by painting with a thin cement wash or by floating, and it is doubtful whether really satisfactory effects have ever been produced by either of these methods on work that was in the forms long enough to get quite hard. The material that ordinarily segregates against the mold forms a skin that seems to have the quality of making very uncertain the attachment to it of any coating, whether of neat cement, paint or of plaster, and if no coating be applied to it and the skin be not removed, the appearance of the work, particularly after a little aging, can be adequately characterized only in language that is too picturesque for a serious paper.

There is, therefore, an active demand for a means of putting a better front upon a concrete body without overloading it in cost.

It has been suggested that a stucco finish can probably be made to adhere permanently, and it is reported that a plaster coating mixture of lime, cement and sand has been tried with gratifying results. A very handsome appearance can undoubtedly be thus obtained, but it is generally as unlikely that the coating will endure wholly intact, and as certain that it will not unless the surface be first carefully prepared for it by some such method as treating with acid or by picking it rough, which altogether would make an expensive finish, and if portions should loosen and come off the condition would be shabbier than anything else that can be conceived.

The mere roughening, however, of the concrete surface to insure the adhesion of a coating of any sort, will itself, if completely and uniformly done, produce a pleasing and ordinarily satisfactory finish—provided, of course, that the concrete has a complete face fully flushed against the forms.

It follows then that tooling the surface to the extent of removing the film is a practicable and always available method of finishing it, and the tooling can be done with a bush hammer or an axe, by hand or pneumatic power. The tool should be

light, and the blows only heavy enough to "scalp" the work, heavy tools and blows being liable to "stun" the concrete, particularly at and near edges. This scalping partially exposes the material of the aggregate but does not clean it. The complete exposure and cleaning will come with time and exposure to the weather if the work be out doors; or the action of the elements can be anticipated by washing the tooled surface with a half-and-half dilution of hydrochloric acid, which of course must be thoroughly rinsed off.

The cost of such tooling, without subsequent cleaning with acid, has been variously found to be from three to twelve cents per square foot according to the character and extent of the work and the equipment.

Experiments upon small blocks have shown that a very expeditious method of removing the skin is grinding with a coarse grained emery or carborundum wheel. The skin is cut about as quickly as the block can be well passed over the wheel, and although no actual comparison has been made and there is no knowledge of a trial of it on large work with a portable wheel, it would seem that with compressed air or electric motor and a flexible shaft, the emery wheel might be used on any work with about the same facility as a power bush hammer, and the rapidity with which the wheel cuts away the face indicates that such a method of tooling will prove to be no more expensive than bush hammering. The wheel might be small in size and therefore of light weight for convenience in handling, and could be fitted with small guide rollers to limit the depth of cutting and secure reasonable evenness in the dressed surface.

Building blocks have been treated, without the preliminary tooling, by immersion for a sufficient length of time in an acid bath strong enough to dissolve the skin and some of the cement mortar between the particles of the aggregate, exposing and cleaning the particles and even leaving them in relief. This process, which is said to have been patented, includes washing after the acid bath, then immersion in an alkali bath to neutralize any absorbed acid remaining, then final washing with water. It is presumably expensive, is of necessity limited in its application to portable work, and care must be taken to avoid using in the concrete any sand or stone that is liable to injury by the acid.

It thus appears that the removal of the film and exposure to view of the clean aggregate by whatever method obtained is the essential feature of the most certainly durable and generally satisfactory surface finish of concrete. Of course it should be understood that the surface must be fully flushed—must be without cavities or visible voids between the stones. This condition can only be secured, when pressure can not be applied, by using wet concrete thoroughly spaded or forked against practically watertight forms, or by using with stiffer concrete a separate mortar or fine concrete applied against the face form with a trowel just in advance of the body concrete. Stiff concrete will not completely flush against the forms by mere ramming even if the ramming does work it to a liquid on the top of the layer. Care must be exercised with every portion of the face or voids will occur and appear when the forms are removed, and will necessitate patching. Such repairs can not be made slightly unless at the time they are made the body is still green—before hard set has taken place. If the surface is accessible while still friable, blemishes can easily be removed without leaving a scar.

This fact suggests the desirability of early removal of the forms, and their removal after the concrete has set sufficiently to maintain itself, but before hard set has taken place, furnishes the opportunity for applying a treatment that is very convenient and inexpensive, yet produces the most pleasing and in all respects most satisfactory finish which has yet become known.

This process consists wholly in scrubbing the fresh surface with a brush and water, thereby removing the film, and with it all impression of the forms, and exposing the clean stone and sand of the concrete. If it be done at the right time—that is, when the material is at the proper degree of set—merely a few rubs of an ordinary house scrubbing brush with a free flow of water to cut and rinse clean, constitute all the work and apparatus required. A little additional rubbing will bring larger particles into appreciable relief, which heightens the effect and, in the judgment of most observers, enhances the beauty of the face.

The practicability of removing the forms at the proper time for such treatment depends upon the character of the structure and the conditions under

which the work must be done. The system can not be applied to the soffit of an arch nor to the underside of a reinforced concrete floor, because the centering must be left as support so long that the surface against it is almost stone hard. If, however, the surface material there is the same as at the sides which have been scrubbed, the soffit can be brought to match the sides by tooling and then cleaning with acid and water as before described.

The texture and color of the surface obtained by this process will vary with the character in the aggregate of the concrete because of a mixture of cement sand and stone the cement is in small proportionate volume and has but little influence on the color of the ensemble. Some opportunity is thus afforded for the exercise of individual taste in texture and color, and it is very easy to arrange a quiet color scheme in any work that may be suited to it. Warm tones can be obtained by the use of crushed brick or red gravel. A dark colored stone with light sand will produce a surface that resembles gray granite. Fine gravel gives an appearance so like sandstone that even close examination will not enable one to distinguish between them. In the construction of monolithic concrete masonry for bridges for the city of Philadelphia it is the practice to use a fine concrete of granolithic face composed of (1) cement, (2) bank sand, and (3) crushed and clean black slaty shale, of the size commonly used for tar roofing—say 1/4-inch to 3/8-inch. This mixture is placed against the face forms and the body concrete is placed against it and rammed into it immediately. In the three years since this process was adopted and during which it has been applied to twelve bridges, no case of separation of granolithic face has been observed, and not a single hair crack has been found, nor any kind of deterioration or tendency to discoloration noticed—indeed the weathering seems to make the surface cleaner and more stone like.

In general the washing is done on the day following that on which the concrete was deposited. Portland cement is used. When a quicker setting cement than usual is met, or through some other influence the surface is found, upon removing the forms, to be too hard for the scrubbing brush, a wire brush is employed first, then a small block of wood or a brick bat with water and sand, which is found necessary to cut the film.

If the surface has hardened so as to require the grinding action of the sand and block the aggregate will not be brought out into very decided relief and the face will therefore be comparatively smooth. In cold weather when crystallization proceeds slowly the forms may require to remain two days before the washing can be done safely, and in very cold weather they have been left a whole week and the scrubbing was successful.

Consideration of the cost of the process may involve the question of the design of the forms. When the work is such that not the whole height of it can be placed in one day it may be advisable to construct the form so that the planks can be removed without disturbing the uprights. This will add to the cost but may be compensated for by the saving in planks. In the case of a long or heavy wall where only one course can be laid in a day only one course of planks is required.

If indentations are made at the joints between courses, the joints can easily be concealed. If the indentations are not desired great care must be taken to scrape thoroughly clean the top of each course quite to the face and to use the same consistency of the new granolithic facing as that of the lower course. It is possible thus to make a joint that will not be very noticeable, but the vigilance of the inspector must not be relaxed at any point, and even then the joint will be at least distinguishable. The bead indentations are very convenient and useful in working, and in appearance they relieve what otherwise would be a large blank area.

When the planks are desired to be removable the studs are set some distance from the face—3 inches to 12 inches—and the planks are braced against them by cleats nailed so as to be easily loosened. The planks are in one width the full depth of a course, either solid or made up of narrow planks battened together. A triangular bead strip is nailed to the face at each edge and the layer of concrete is finished at the middle of the top bead.

When a plank is taken off it is scraped clean of adhering cement, then oiled, and reset with its bottom bead fitted into the half indentation just left by the top bead.

A couple of carpenters with perhaps a helper will take off and reset a course of plank, say 100

feet long in four to eight hours. The course may be whatever is desired for either convenience or architectural effect. The yardage of concrete accommodated will vary also with the thickness of the wall and the proportions of face to back. Thus the cost of changing forms will vary from 25 cents to 75 cents per cubic yard. In building work generally the ordinary forms can be used. Of course care must be taken not to load members too heavily while they are green and naked, but the same care should be exercised with members still in forms because the forms while preventing collapse will not prevent injury to the concrete by undue pressure upon it.

The cost of the scrubbing is trifling if done at the right time. A laborer may wash say 100 square feet in an hour, or the same area if it has been permitted to get hard may take two men a whole day to rub into shape.

The early removal of the forms makes possible the neat repair of any blemishes that may be revealed.

The question of efflorescence is an important one in the consideration of the appearance of concrete structures. The scrubbed surface is not subject to the hair cracks that in some faces seem to absorb moisture during storms and then exude the white spreading disfigurement. But if there are joints in the work there is danger of the efflorescence, and observation leads to the belief that if within twenty-four hours of the completion of a course the top surface be carefully scraped to remove every particle of the "laitance," and then before depositing the next layer of concrete the scraped surface be coated with thin cement mortar, the joint ought to be impervious to moisture from either front or back, and no trouble with efflorescence ensue.

Exhibited herewith are samples of scrubbed surfaces of granolithic face mortars made with different aggregates.

1. Granite screenings.
2. Crushed red clay brick.
3. Crushed red shale paving brick.
4. Screened yellow bank sand.
5. Screenings of yellow bank sand.
6. Quartz sand.
7. Unscreened yellow bank sand.
8. Bar sand.
9. Black slaty shale stone with bank sand.

"The Artistic Treatment of Concrete," the paper by Linn White, gave a thorough description of the treatment of concrete works of varying characters with different solutions of acids. The paper will be presented in full in a later issue.

The evening's session concluded with Charles D. Watson's report of the Committee on Art and Architecture, which report was illustrated with stereopticon views of concrete works of all descriptions in various sections of the country. The speaker was loudly applauded at the conclusion of his paper, which will be issued in a future number.

THURSDAY MORNING SESSION.

Following the meeting of the section on Streets, Sidewalks and Floors, and Reinforced Concrete, H. H. Rice presented his able paper on "Concrete Blocks," which appears in this issue.

CONCRETE BLOCKS.

BY HARMON H. RICE.

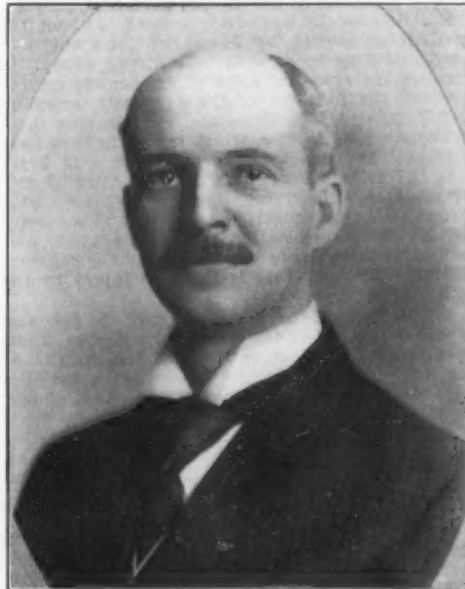
Because I believe that concrete block construction presents a representative style of architecture, typical of that spirit of independent enterprise characteristic of American progress, and because Europe, Asia, Africa and the islands of the sea are looking to The States for light upon this industry, I characterize the conduct of our business, or if you please the practice of our profession, as The National Game, believing that in the play of The Diamond we shall find an interesting and instructive parallel to the opportunities and responsibilities of co-workers in the domain of concrete blocks.

In the Pitcher's box stands the stalwart Block Maker, in stature well proportioned, by nature a good mixer, through systematic training always in good form. There are too many smart men, and too few able men, filling this position. The time has passed when the pitcher may, with clever curves, deceive the watchful batter's eye. The batters of wood, clay and stone have learned to

know those curves. The victory of the day is to him who, with perfect mastery of self and with thorough knowledge of the field, delivers a ball which is strong, swift and true—a thing of beauty and a winner forever. In the throwing of such a ball there is successful introduction, there is permanent and increasing patronage, there is profit, and there is public favor. Uniform excellence rather than spasmodic brilliancy counts on the score card.

The Superintendent takes the Catcher's place, because from this position the personal equation can never be eliminated. Whatever may, with truth, be said for the efficacy of modern appliances adapted to playing the game, however completely the catcher may be equipped with mask, mitt and shield, it is in the end the man behind the bat that saves the day. It is his quick eye, supported by a studied knowledge of the field, an intimate acquaintance with the players, and an intuitive recognition of the vulnerable points of the opposition, which brings his adversaries to shame. It is he who must watch the field and bases, to the end that he may even support the play and co-operate with the plans of the several players.

The Machine Manufacturer we put on First Base because in those olden days when we "chose up sides" he who came first usually claimed this position. So, by precedence in the field, it goes to the maker of machines. When he first took the place we had not that full quota of players



HARMON H. RICE, DENVER, COL.

which we find to-day. He had some sorry days before the game was popularized. But he was a persistent player. And then there came a time when some of those on the bleachers said that the first baseman drew higher pay than the pitcher, but that day too has passed, for the game draws greater crowds and the pitcher's skill is cheered by audiences who have learned to know its merits and to watch the ball. And yet does not our first baseman rest too easily upon his laurels; does he not rely too much on the pitcher's skill and the catcher's diligence to increase the interest of the game? Rank imposes obligation, and our first baseman may not shirk the responsibilities incident to his birthright.

On Second Base we have the Cement Manufacturer. He plays well, though at times lacking enthusiasm. But he has many rival interests, with his golf and his cricket and other games which he learned in the land of his birth. And yet he is, withal, a dependable player, a player of quality, a player who always stands the test. In the changes of climate incident to the migration of the Club, in freezing and in boiling weather, his tenacious qualities prevent its disintegration. His strength is so great that he does not become distorted, even when the umpire's words are thrown at him. In emotion he is paradoxical, in as much as his heart strings have been torn asunder by one-tenth the grief necessary to crush him.

The Mason is on Third Base, where careful accurate and uniformly excellent work is required. Too often has a wild throw from third enabled the runner to land safe on the home plate. Perhaps it is not too much to say that the slovenly mason's work on third base has lost more games than the careless work of any other single player. He has regarded our National Game with less favor than those games handed down to the present generation from the ancients of Egypt and Assyria. His longer training in the games of the Orient has made his hand cunning to their play, and he has imagined that in seeking their perpetuity he was insuring more continuous activity for himself.

Our Salesman Short-Stop is so optimistic concerning the ultimate success of the game that many regard him as visionary. And yet to him is due the credit of earnest and persistent work toward the realization of his visions. He has gone into waste places to introduce the game, by his intimate knowledge of its rules he has taught others to play without error, by his consideration for the ultimate well being of his associates he has silenced the tongue of slander, by his energy and fair dealing he has gained the respect of the opposition, while his good counsel has enabled his colleagues to make plays of such unexpected quality that the grand stand rocks with applause. In his success there are no secrets save honest, loyal and untiring zeal. He has studied the game well, he knows the men, he keeps his eye on the ball, and he enjoys the confidence of his fellow-players, of his opponents and of his umpire.

The Architect is in the Left Field, and it is only when the pitcher throws carelessly or a mighty man comes to bat that the ball reaches him. Hence he has much time to watch the exertion of other players, and he seems to be growing a bit restless and anxious to come closer in the game. Time was not long ago when he refused to play, but as he sat on the bleachers and fanned himself with his hat he could but observe the intrinsic interest of the game and the ever-increasing skill of its players. He is now one of us. Let us welcome him, and applaud heartily when he plays well.

The Contractor in the Right Field takes an exceedingly practical view of our game. To the vox populi his ear is ever open. He is a good player, but ready to stay with us or to leave us as the crowd may applaud or deride. So he keeps one eye on the grand stand, and if handkerchiefs be waved and hats flung high his energies rise to mighty plays. With the increasing popularity of the game, it is hoped that he will become more settled in his appreciation of its merit.

To our good friend, the Journalist, we give Center Field, and in it he does valiant work. The shouts and plaudits of the throng are dear to him, and he adds greatly to the joy of all by those spectacular plays which ring encomium from the very boards on which spectators sit. He may not know all about the game, but he is powerful in talk, and he keeps up our spirits on days when things go badly. It is his wide reputation which has added so largely to the gate receipts and sometimes, when crowds are not what they should be, the captain excuses him for the afternoon to go down among the newspaper offices and fill the galleries with the history of our past triumphs, the story of our present greatness, the prophecy of our future magnificence.

The owner of the building in which concrete blocks shall go is our Umpire. To win from him the coveted decision it is not enough that one should play well—he must play at his best. The umpire knows the game better than do some of its players. To attempt deception is to invite his displeasure. Honest, manly, fair play counts with him. He does not greatly mind the so-called brilliant plays. The player who wins his enduring approval is that one who is ever in form, who day in and day out, strictly observes the rules of the game, who avoids errors as a plague, and who invariably plays a good game.

If we are in the game let us play it as well as we are able. Let each man, while performing to the utmost limit of his ability the duties of his particular position, never fail to render with heart and hand that support to his fellow-players without which the game can not be a success. In community of interest, and unity of endeavor, lies the ultimate success of the Nine.

In any discussion of concrete block construction, the basis of consideration is form. As to the importance of form, I am indebted to Mr. George Hies for a most forceful illustration. In his new book, "Inventors at Work," he tells of an experi-

ment made in Canada during very severe winter weather. A piece of ice was fashioned to the form of a lens, and so effectually did it focus the sun's rays that the paper was burned and wood was charred in the same manner as though an ordinary reading glass had been used. Thus is shown the paramount importance of adapting the form of structural material to the service required.

The plasticity of concrete enables it to be molded into units of greater utility than those of any other building material known to mankind. Without attempting to speak of the many forms on the market to-day, it may be said in respect to all that the air space in the wall gives to block construction its distinctive advantages. Too readily do we allow minor considerations to rob us of an adequate air space, and too careless are we of the encroachments of those building departments which reduce it to a point which strips the concrete block of its essential points of superiority. There is, I hold, no excuse for making blocks of so inferior quality that the percentage of air space need fall below that requisite to the preservation of fire-proof, frost-proof, moisture-proof, heat retaining and heat resisting walls.

But to maintain this high standard of quality the ingredients must be right, and they must be used in such relative proportions that voids will be eliminated, and maximum strength and density will result. It is the application of scientific principles of concrete work, rather than the haphazard use of a large proportion of cement, that makes for quality.

The thorough manipulation of the mass is more essential in block manufacture than in any other branch of concrete engineering. Where defective blocks have been produced, investigation has generally disclosed faulty mixing. Hand mixing is seldom sufficiently thorough, while operators in the smaller towns have been unable to bear the expense of installing and operating a power machine of standard type. The present season, however, brings to the relief of such operators a machine hand mixer of adequate capacity, which mixes thoroughly, and leaves no excuse for clinging to the shovel and hoe of former days.

Of curing I would that the time permitted me to speak exhaustively. Herein lies success. Drying is not curing. Aging is not curing. Curing is a scientific process by which a plastic body of concrete is converted into an enduring stone-like unit able to honorably bear the duty for which it is designed.

It is not in a spirit of criticism that I advocate the application to concrete block manufacture of scientific principles of concrete engineering. Rather is it because I thoroughly believe in the ultimate ascendancy of this type of building, and because a duty is upon me to urge universal maintenance of the highest standard of quality in what will to-morrow be known as the great American industry. Great because it reaches the very heart of our people in the construction of strong, durable, comfortable and slightly homes at moderate cost. Great because it reaches from the metropolises to the most remote hamlet of the nation. Great because it affords that opportunity which without it is withheld of building enduring habitations in the desert, warm abodes in the north, cool houses in the south, dry houses in the valley by the great river, fireproof homes beyond the highways of horse carts.

I know full well that I have but touched the edge of that fertile field wherein the uses of concrete blocks are ripening for the harvest. I know full well of their efficacy in the ornate palaces of the rich, and in the imposing edifices of county and of state. And yet it seems to me when the end is told it will be known that concrete block construction finds its ideal application in the homes of Americans, and that in those homes it will find an ultimate glory over which the lofty scraper of the sky may cast no dimming shadow.

If we go not from hence with a fuller appreciation of the dignity of our calling, with a higher regard for the merits of our merchandise, and with a firmer resolution to lift the concrete block industry to that high place of public favor to which it is rightly entitled—our meeting together shall have been of no avail. Not how cheap, but how good, can concrete blocks be made is the battle cry with which the ranks of this association must resound as we go from this convention hall to wage ceaseless warfare in a campaign which shall not devastate the enemy's land, but shall beautify, and enrich, and build up, the country through which we march to victory.

The discussion of this paper was opened by S. B. Newberry in his usual able manner, who dwelt particularly on the necessity for using gravel instead of fine sand, especially for facing. The danger of the use of fossiliferous limestone, or limestone containing fossils was entered into, and in the matter of steaming blocks, Mr. Newberry made clear the fact that lime hardens when kept dry, while it is necessary that cement should remain moist to accomplish the best results. In discussing the difference between the dry and wet made block, he said a block that is mixed sufficiently wet so that it will slightly sag when taken from the mold will give the best results both in color and in ultimate strength.

Tests of Building Blocks, by R. D. Kneale, of Purdue University, and also the report of M. S. Daniels, chairman of Committee on Concrete Blocks and Cement Products, were interesting and will appear in a future issue.

The morning's session concluded with J. F. Angell's paper on "Machinery for Cement Users," which follows in full:

MACHINERY FOR CEMENT USERS.

BY J. F. ANGELL.

In taking up the subject of Cement Machinery one realizes that what has been and what can be or should be said regarding same would make a good sized book. However, I do not feel that I am capable of "completing the book," nor do I feel that I can add much to what has been brought out on the subject at previous meetings of this kind, neither do I think it would be justice to those assembled here for me to endeavor to make them believe I know all that is to be known about cement machinery, for, in my estimation, there is still so much to be learned it will keep all that are interested very busy for some time.

Some say the experimental point has been passed. It is perhaps true that the matter of the durability of cement products as a building material is no longer an experiment or a conjecture, but how many manufacturers of cement machinery or cement block know or have made an effort to ascertain what is necessary to furnish material that will meet the requirements of the architect or builder I believe you will agree with me there is a very limited number.

I think I am safe in saying that the majority of those who have embarked in the cement block business never thought for a moment what would be required of them in the way of furnishing blocks of different sizes, designs, etc., but as a rule it was not long before they realized that their patrons demanded something more than a foundation block, making it necessary to purchase additional parts or better machinery, and with this experience no doubt they would advise those anticipating going into the business to investigate carefully and to purchase the proper kind of machinery and enough of it to meet the demand.

Generally when an individual or a corporation decides to manufacture cement block the first thing they do is to write to every cement machinery manufacturer they have ever heard of, or can find advertised in the trade papers, for catalogue and other printed matter. In due time they receive a number and variety of booklets setting forth the merits of the various machines, each claimed by its maker as the best and only one on the market that will meet all requirements. In addition to this the would be purchaser's life is made miserable by agents or the representatives of the different machine companies and after they get through telling him or them all the superior points of their machine and the inferior points of all the others the prospective purchaser finds himself entirely at "sea" and hasn't the least idea what he wants, consequently he is obliged to adopt some other method and in thinking the matter over he naturally looks the catalogues, letters, etc., over again and selects a few of the machines that strikes his fancy and writes the manufacturers for further information and prices. The prices he receives of course vary and the question of price should always be considered, but it should not be considered at the expense of a good product.

A machine should be judged according to its value as a producer. It is well and honestly made and capable of producing a large variety in the way of sizes, designs and perfect block. It is better and cheaper than a machine that costs less and is capable of producing only one or two size block, and the purchaser will realize this as

soon as he fairly gets into the business. It is sometimes hard to make him understand this before he has had the experience and, as a rule, he is slow to be convinced that the best money he can spend is for a good concrete mixer, to properly mix his material. At the same time it is no trouble to convince him that it is necessary to purchase the best grade of cement, but he will insist that on account of his going into the business in a small way mixing this "high priced cement" by hand will answer, for the present at least, not realizing that it is impossible to mix the material that way so the amount of cement and sand, or other material, will be the same in each block, therefore, making it possible for the block to be criticised and probably condemned, especially in new territory.

No one knows better than the machine manufacturers how difficult it is to convince a purchaser what is for his best interest and I feel that in a great many cases the manufacturers or their representatives are to blame. Why? In the first place, I believe we will all agree that no business for years has made the progress or has been brought to the attention of the general public as rapidly as the product of cement as a building material. It has been so rapid and attractive and the prospects of large and quick returns have been so flattering that hundreds of inventive minds have been put to work, for the purpose of bringing out a cement block machine a little different from some other and so well has the inventive genius of our great country been brought to the surface the market is flooded with cement block machines that can be bought at any price, from \$5.00 up to \$800.00 or \$900.00, and in a great many instances the agent is allowed to regulate the price to the detriment of the manufacturer. And in looking over the vast number of machines it is no hard matter to see that only a limited number of the inventors or manufacturers had anything in mind but the bringing out a machine for the market, thinking it a gold mine and entirely losing sight of the necessity of producing a machine that will produce material to satisfy the architect and others. We often hear people say, "Why are the architects so slow in recommending cement block?" Can we wonder at it when we stop to consider that perhaps not one in fifty inventors or manufacturers even thought it necessary to confer with an architect or builder to ascertain what they want a machine to produce, and at the same time we know that no one is more particular and harder to please than an architect and he has a perfect right to be, as his business and reputation depends entirely on the work he produces and we can not expect any responsible architect to throw aside different material he has become perfectly familiar with for one he knows little about, until such material is given to him in perfect condition and in all the sizes and forms he desires. When this is done I anticipate no trouble in the way of the architect being with us.

A number of manufacturers have put in years of study and energy and any amount of money in perfecting their machines and have succeeded in bringing them to the point of perfection and have been rewarded for their efforts to give to the public machines noted for their simplicity in construction and free from complicated mechanism as possible, and while continually reaching out for better means of operation they never for an instant have lost sight of this point so important to the operator. At the same time it is unfortunate that many a good machine has been condemned owing to the use of poor material and the unbusiness like method of the operator. For instance, I heard of a case only a short time ago, where an operator had a fairly good machine but the machine and the blocks he produced were condemned on account of the blocks disintegrating in the center, and upon investigation it was found he made no effort whatever to tamp the material, simply filled the mold box and struck it two or three times with a piece of plank to which a handle was attached, and when he was told he should tamp the material properly he replied that his was good enough, as it forced all the air out of the block, and no doubt we would find many cases just as ridiculous as this.

We feel, however, that there has been a vast improvement in the past year, both in the manufacture of cement block and machinery. We realize it more every day, as we find those who contemplate purchasing machinery are taking more time in getting information relative to the business and investigating the merits of different machines and making an effort to purchase enough

and the right kind of machinery before establishing their plant.

My idea of establishing a cement block plant is to use the same discretion and judgment as is generally used in establishing any other plant. No person or company ever thinks of establishing a brick plant with anything but the best and a full line of machinery, regardless of the cost, and when we consider the cost of brick machinery as compared to cement block machinery we wonder why there should be any doubt of the advisability of using the same method in purchasing cement machinery, and I would suggest to those contemplating going into the business and to those now in the business and wishing to enlarge, spend a little time and money in investigating, call on the manufacturer, see what he has and give him an opportunity to give you the benefit of his experience, and if he is honest and has the cement interest at heart you will be the gainer. Do not hesitate to purchase good machinery, mixers, cars, ornamental molds, etc., and if you are so situated as to make it possible, establish a steam curing plant. Then make good honest block, get the confidence of the public and there will be no doubt but what cement block will be appreciated and you will find it a profitable business, for such has been the experience of those who have endeavored to do business this way.

I might dwell further on this subject, but feel it would only be imposing upon your good nature and I would probably only repeat what you know and have heard before, besides I feel that the time of this convention is entirely too valuable to be taken up further by me, and in conclusion I hope I may be able to impress upon every member of the association the importance of their putting forth their best efforts in furthering the cement interest and by practicing what we hear The Cement Users' Association will continue to be a success.

Instead of taking this evening as originally provided for a social night off, as it were, the members were so thoroughly interested in the business proceedings of the association, that it was decided to have a Question Box prepared, which would be answered to the best of the president's ability, and discussed during the evening.

Among the several questions were the following:

Which is most durable, the wet mix or dry mix block? The wet block gives a greater strength than a block made by the dry process.

What merit does furnace slag have as a concrete aggregate? Slag has no particular merit, but if it is old and thoroughly seasoned, may be used with safety in heavy concrete work, but can not be recommended for use in thin blocks.

Is limestone a good material to resist fire? Limestone is disintegrated at comparatively low temperatures by fire. If the limestone forms part of the face of the brick exposed to intense heat, the carbonic acid gas will be driven off, and the limestone will go to pieces. If the face of the block is made of mortar, of sand and cement, this will act as a protective coating and thus save the stone, but if the heat is intense it may penetrate through the mixture.

What is the cause of efflorescence and how can it be prevented? The more porous the material, the greater the efflorescence is likely to be. Therefore, the denser the block is made, the less efflorescence there will be.

At the conclusion of evening's discussion, it was the unanimous decision that the evening was well spent.

FRIDAY MORNING SESSION.

Immediately following the meeting of the Section on Testing Cements and Cement Products, Concrete Blocks, the president gave a full talk and description of just what Portland cement is and how it is made, following which he announced that a committee had been appointed on Specifications as recommended by the Committee on Testing. This committee is to formulate specifications which are to be sent to the members of the association not later than June 1 for criticism, in order that the subject may be in the best possible form for presentation at the next convention of the association.

Water-proofing was the next subject to be taken up, and papers by the following gentlemen were read, the first two of which are produced herewith and the balance of which will be produced in a subsequent issue of the paper: H. Weiderhold,

R. R. Fish, Edward DeKnight, G. F. Fry and S. J. Binswanger.

WATERPROOFING.

BY R. R. FISH.

There are many methods in use for obtaining waterproofed results in concrete work, even though some of the methods give questionable but temporary results.

There are, for example, a great number of washes on the market which are sold under the head of waterproof compound, but we all know that even the best white lead paint exposed to the weather eventually has to be replaced, therefore I have no faith in waterproofing compounds applied in the shape of a wash. There is one other serious objection to a waterproofing wash, which is, that the color of concrete work generally suffers from its use and the company I represent has on file letters to the effect that out of five or six different waterproof washes tried by responsible parties, none of these gave satisfactory results.

There are also the methods of waterproofing with paper, tar, asphalt, pitch, etc., and in work done under these systems it frequently happens that where the paper laps, leaks are found, and where pitch and asphalt and tar is used the concrete mass is separated and the strength of a floor or wall constructed of concrete is therefore impaired; for example, in waterproofing a concrete cement floor in a building asphalt is sometimes used between the bottom course and the finishing coat. This prevents the finishing coat from adhering to the bottom course and with heavy use, in time, such a finishing coat is liable to separate and break.

Mr. S. B. Newberry, who is unquestionably acknowledged as an authority on cement chemistry and the uses of cement, has made an exhaustive study of waterproofing concrete work and has arrived at the conclusion that the material used for waterproofing concrete must be a substance which in no way affects the strength, color or setting qualities of cement; at the same time it must be a substance which is embodied in the concrete mass.

There is considerable talk in the cement journals of elastic waterproof compound and some engineering papers even go so far as to say that concrete work can not be waterproofed until an elastic waterproofing material can be discovered; that is, one which will contract and expand with the concrete work, in order that no cracks occur that would permit the passage of water.

The material which I have here and which I intend to demonstrate to you does not absolutely fill the voids of concrete, nor is it necessary to fill the voids of concrete to make it resist water. The material here resists water sufficiently so that with the use of one to two per cent of the weight of cement employed, reservoirs, cellar floors, walls, concrete blocks and all classes of concrete construction can be made absolutely waterproof.

Some of the cement journals have recommended the use of soap and alum as a waterproof solution, and in regard to this would say that I recently superintended the waterproofing of the Herblora building for the Cincinnati Zoological Co., at Cincinnati, Ohio. That building was constructed of reinforced concrete and the roofs of the building had received a treatment of soap and alum mixture. This did not give satisfactory results and the building leaked in every section.

The trustees of the building decided to sheath the roof with copper at great expense and the company which I represent, and which manufactures this waterproof compound I have here on exhibition, induced the board of directors for the Zoological Co. to apply a cement mortar coat to the exterior of their building, this mortar coat to contain a 2 per cent mixture of this water-proof compound.

Going back to the subject of an elastic waterproofing material, would say that if concrete can be waterproofed at all, there is no material that can be added which will find its way to any serious cracks that appear in concrete structures or any material that can be used in any way to remedy such cracks, unless such cracks may be corrected by being filled with a cement mortar containing waterproofing material. There is hardly any danger of serious cracks occurring in Al concrete work, and therefore if the concrete is put in properly under a good superintendent and in proper proportions this water-proof compound, if used correctly, mixed dry with cement before

sand and water are added, will secure for the engineer a perfect waterproof job.

WATERPROOFING.

BY H. WEIDERHOLD.

By invitation of your president I have been asked to speak to you to-day on the subject of "Waterproofing." It is especially gratifying to me to be asked by a gentleman who has known me for a long period of years, and who knows the nature of the work that I have done as manager of our company.

One of the largest pieces of work done in the "city of brotherly love," was the widening of Delaware avenue, and in connection with the same the concrete sea wall along the Delaware river, which was done by our company while your president was with the department of public works. Hence, I am justified in supposing that our efforts at that great piece of work, as well as at others which came under his immediate attention while he was connected with the department of public works, were approved by him, and hence warranted him in conferring upon me the honor of addressing you to-day.

Waterproofing, and especially waterproofing with asphalt mastic, is my theme. I have had the pleasure of speaking to various engineering societies; yes, even to the Western Society of Engineers in this city, on the same subject; but I have never had the opportunity of addressing a body of men of my own stripe; men who not only plan in their cushion covered office chairs ways and means to do a certain difficult line of work, but on whom it devolves to go and execute these various tasks. You all, indeed, have experienced that to plan and devise a piece of work is one thing and to execute it is often quite another.

We all, I know, swear by cement, and some of the older ones, among whom, I am sorry to say, I have to count myself, know how foreign cement domineered this country and what a hard fight we had to wrest the supremacy from foreign cement in our market, and how we finally succeeded. But I am proud to say that to-day American cement, made from America's own native product, in American mills, and by American ingenuity, now rules our market. Yes, I may go further and say that it is making vast inroads in foreign countries and is proving a strong competitor to English and German cements. In our own country I might say that we have driven them from their last ditch.

What immense progress has been made in the use of cement is known to you all. To say that the whole usage of cement has been revolutionized is putting it mildly. Who dreamed ten or fifteen years ago that we would rear skyscrapers, build bridges, and do almost everything imaginable with cement, or make inroads on steel and stone construction?

You must admit that too often in your work the time has come when you were compelled to find some material which would waterproof your foundations for buildings or waterproof your bridges; keep out dampness; not easily disintegrate when in contact with water; not to be affected by climatic changes, and which stands heat and cold without cracking; protecting your iron constructions, no matter of what nature they be; meeting requirements for sanitary floors, water closets, kitchens, sub-basements, breweries, and, in fact, for any kind of floors where water is used to a great extent, and where floors have to be water tight. You all know, as well as I, that cement will not and can not fill the bill.

In order to obtain the best results for waterproofing I have tried various materials, and I shall give you my experiences of the last twenty-five years in my researches in this and foreign countries. But do not think for one moment, however, that I shall use the courtesy extended to me of speaking to you to-day as a cheap advertising scheme for any certain material. No, gentlemen. I would not violate in that manner the common rules of etiquette. The material of which I am going to speak is in the open market and can be bought by all of you in the same manner as any other product.

Asphalt mastic I have found to be the most efficient material for waterproofing. Now, a great many of you have used asphalt mastic and know all about it, but I have found by experience that there are also a large number of architects and men in the business who know little or nothing about this valuable material, and this was my reason for delivering the various lectures on the subject.

I shall refrain from reciting to you how asphalt mastic was used in the olden times, how even the fishermen of Galilee used it to make their boats watertight, that in Greek it was called "asphaltos," in Latin "bitument," and in German "erdpeck." I shall not tire you with a lot of ancient history, as we are dealing with the present and not with the past.

Rock asphalt is found in Val Travers, or Val de Travers, in the Canton Neuchatel, Switzerland. In Seyssel on the Rhone, in the French department of de l'Ain.

In Lobsann, a little village of the North Elsass. At Limmer, a small town near the city of Hannover.

At a small town, Vorwohle, in Branswick.

And at Ragusa, on the south coast of Sicily.

The rock asphalt of the above mentioned different mines consists of about 70 to 85 per cent of carbonate of lime, 8 to 15 per cent of bitumen, a small proportion of oxygen of iron, and a small proportion of carbonate of magnesia. While I have at my command, and could give you exact analysis of each of the different rocks mentioned. I shall refrain from doing so, as I wish to be fair with all rocks.

The proper and only way to prepare the asphalt mastic correctly—by this I mean the marketable article which is ready for shipment or use—is in the first place to have the rock, as it comes from the mines, picked and sorted, and to have those portions of the rock which are not thoroughly impregnated with bitumen thrown to one side. With a little experience and judgment this can easily be done. The rock, after being broken into pieces, either by machinery or hand, to the size of about nut coal, is thrown into a disintegrator and pulverized to a fine powder. The flux (neither light volatile oils nor coal tar, but a flux of pure bitumen, refined from the best possible asphalts, Bermudez or Trinidad) in proper proportion is placed in specially built melting tanks and subjected to indirect heat and continuous agitation; and, after being thoroughly heated and made perfectly fluid, the pulverized rock is added to the same. The kettle is now closed, and this mixture is left to cook for from four to six hours, at a heat of at least 250 to 300 degrees Fahrenheit. An experienced eye knows when the mixture is ready to be drawn off into molds. These molds are either spare, round or octagon in shape, according to the manufacturer's trademark, and each one having a capacity of about 50 or 60 pounds of mastic.

After the mastic so drawn off has sufficiently cooled, and having been stamped with its brand, it is taken from the molds and is now ready for shipment.

I can not help but express that, in my estimation, it is by far the safer way to import the rock in its crude state to this country and manufacture the mastic here, rather than to buy the manufactured article, as in the latter instance you are more liable to buy a "cat in a bag," as adulteration can easily be practiced on you by your European brethren. Especially have I been strengthened in this opinion since my last visit to Europe.

The prepared asphalt mastic is now ready to be brought into use by the asphalt mastic operator, and now the judicious manipulating by the experienced workmen begins. Placing the right amount of mastic, fluxing the same with the proper ingredients, adding the right amount of grit, and perhaps some sand, just as may be required by the proposed work, the material is kept cooking under continual stirring, and is ready for use whenever a wooden stick inserted in the mixture comes out perfectly clean, no material whatever adhering to it. It is then spread with the help of wooden spatulas, or floats, to the required thickness on the prepared foundation, and, after having cooled sufficiently, is rubbed with the help of fine sand and sandstone to a smooth surface.

By no means am I, or anyone familiar with the mixing of the mastic, able to give you a uniform mixture to be used for all floors and waterproofing. The mixture depends entirely on what use the floor is to be put to, as it requires different mixtures for various purposes, and it is here that the experienced workman comes in.

Great care must be taken to ascertain what is required of the floor to be laid; whether it is to be used under or out of water; whether acids, if so, what kind, are to be used on the same, whether the room is to be kept cold or warm; and, in fact, only after taking everything into consideration, can the mixture be decided upon.

An asphalt floor, by long odds, is more advantageous and will yield better results in cellars or

ground floors where the moisture of the underlying ground may affect the floor.

Also a cement or any other floor absorbs the moisture, and takes a long time to dry if cleaned with water. To verify this assertion I had a piece of cement pavement one foot square by one inch thick weighed when perfectly dry, and found that it weighed 20 pounds 12 ounces. I then laid it in water for a period of 24 hours, and again weighed it, and found that it had absorbed 1 pound 8 ounces, making a total weight of 22 pounds 4 ounces.

I did exactly the same thing with a piece of asphalt mastic flooring of the same size and in 24 hours it absorbed only 1½ ounces.

Natural deposits of rock asphalt have also been discovered in our own country, namely, in Kentucky and in Indian Territory. Our company has gone to a great deal of expense in experimenting with these rocks; yes, we shipped right into this city at a great cost a car of rock from Indian Territory, and I myself experimented with the same, and we found that rock from either Kentucky or Indian Territory will not make good asphalt mastic, and as much as we dislike, we must depend upon the product of the European mines for pure rock and rock that will not disintegrate.

In my experience I do not know of any material in existence that has been so much sinned against as asphalt mastic. Any one who has money enough to buy a barrel of coal tar and a pot to melt it in can mix this material with sand, and then call it genuine rock asphalt. Cheap oil asphalts are often used in the production of asphalt mastic, and the unsuspecting architect and general contractor are deceived. If work done with this kind of material does not turn out to be water tight or disintegrates in a short time, asphalt mastic is condemned, and is pronounced no good. I, however, positively defy contradiction, may it come from an architect, an engineer or a worker in asphalt mastic, when I say that if genuine asphalt mastic is used, it will do all that I claim it will. Still your architect will tell me, "I have specified asphalt mastic; yes, I have even gone so far as to use specifications made by you, and still it did not do the work." Your general contractor will say, "I have used asphalt mastic, and it has fallen far below what I expected it would do." I have asked, and do ask now, whether you have used genuine rock asphalt, or something which has been panned off on you as the genuine article. I assure you that in every case that did not give satisfaction some other material than asphalt mastic was used. To prove to you that I mean just what I say, let me cite to you a few of the many instances which have come to my observation during my business career, and which I can substantiate, if so desired, by giving the name of the architect, the building and the place.

A large tunnel was to be constructed from one building to another in one of our principal hospitals in Philadelphia. It was to be used as a passage way for the nurses, and also to carry the steam pipes from one building to another. Asphalt mastic was specified for the waterproofing, and we bid on the work. The contract, however, was given to another contractor for less than it would cost us for the material. After the work was finished and the steam which was to be carried from one building to another was turned on, the heat naturally caused contraction in the cement walls down to where the waterproofing was placed, and before long the beautiful, so-called pure asphalt mastic began to run out in little streams on the floor of the tunnel, and the nurses and attendants naturally carried this so-called liquid asphalt mastic throughout the building and into the sick chambers—a very pretty state of affairs. The architect insisted on my going with him to investigate the cause. I was satisfied and could have told him what had caused the trouble before we went, but to please him I consented to go, and I found exactly what I had expected. To convince him that no asphalt mastic had been used I just held a lighted match against some of the material and the odor and the way it ignited soon convinced him that the supposed waterproof asphalt mastic was nothing more than coal tar mixed with sand.

A certain architect who prides himself on having built more Y. M. C. A. buildings in our part of the country than any other architect designed a Y. M. C. A. building for Coatesville, Pa., and one for Niagara Falls, N. Y. Naturally every Y. M. C. A. building has to have a swimming pool, as we all know that cleanliness is next to godliness. These buildings were built and we were asked to

bid on the swimming pools. On the swimming pool for the Y. M. C. A. building at Coatesville we bid without success, on account of the price. Coal tar or oil asphalt is cheaper than asphalt mastic and our bid was considered too high. The first time the hot water was turned on the glazed brick which formed the inner lining of the pool, back of which the supposed asphalt mastic was laid, even these bricks thought that they might enjoy a dive in the pool, and as nothing but oil asphalt was holding them to their places they could readily have their desire, so down they came. The architect came to me in a surprised manner, said: "I used your specifications."

My natural answer was: "I am exceedingly sorry, but pray did you use asphalt mastic?" Out from the architect's pocket came a sample of what he supposed was genuine asphalt mastic. It did not take a chemical analysis to determine what the material was. Pardon me for using slang, but I had been up against it before, and my lighted match again did the trick and convinced the architect the asphalt mastic had been made out of oil asphalt. Just about that time we were called to Coatesville by the president of the town council, and on meeting him he informed me in a pleasant way that the two reservoirs which we had lined eight years ago for them had stood so well and had not cost them one dollar of expense during all these years, that they desired to give us the third reservoir to line with asphalt mastic. I used this opportunity to investigate the swimming pool in the Y. M. C. A. building at Coatesville, and the least that I can say is that it was a pitiful sight to see the otherwise well constructed swimming pool completely spoiled by the use of improper waterproofing materials.

I did not see the swimming pool at Niagara Falls and can only say from hearsay that it was in about the same condition as the one at Coatesville. Since then the same architect has designed another Y. M. C. A. building at Hazleton, Pa., but he has inserted plainly in his specifications that the swimming pool shall be built by us.

But not alone adulteration of asphalt mastic is proving a snag in the waterproofing business. The various kinds of paper, burlap and some great inventions which you simply squirt against the wall which is leaking, have been extensively advertised, and have been used with perhaps some success. I am not here to condemn any of them, and I do not wish to tramp on anyone's toes, but I certainly have the right to tell you my experience regarding some of these materials.

When the first part of the subway in Philadelphia (that is, from Fifteenth Street west to Schuylkill river) was to be built, I was invited to meet the president and the chief engineer of the Philadelphia Rapid Transit Co. regarding the waterproofing and finally asphalt mastic came out victorious. We did the work and so far not a single leak has been found. When the second portion (that is, from Fifteenth Street east to the Delaware river) was to be given out, strong influence was brought to bear by a paper and compound company, and I had no light task in convincing the officers of the Philadelphia Rapid Transit Co. that paper would not do.

You all know that to hold up the roof of a tunnel there must be placed at certain intervals supports of heavy timber, and the waterproofing must be done around these supports. After the waterproofing has sufficiently hardened the supports are moved on the waterproofing and the spaces which they occupied have then to be waterproofed. This you can readily see can not be done effectually with paper. It would simply mean a patched job, and we all know that a patched pair of pants is not as good as those made out of the whole cloth.

It is quite different with asphalt mastic, however, as all that is needed is to heat the sides of the first laid mastic and then apply new asphalt mastic, and you can make a joint which the most experienced mastic layer afterward can not find, and in that way you get a perfect monolithic and continuous sheet. On this very essential score we were awarded the contract for the second portion of the subway, and we are now laying asphalt mastic from Fifteenth Street down the Delaware river over the whole length of the tunnel.

The subways in New York and Boston are lined with paper and asphalt compounds, and you can readily ascertain whether they are water tight. As we laid all the cement work at the various underground stations of the New York subway, I can say from my own observation that the tunnel is not water tight, and from what I have heard the Boston subway is not much better.

About nine years ago we laid a saw-footed roof on the Fidelity building, Philadelphia. On the sharp incline five-ply paper and compound were specified, while on the other part of the roof asphalt mastic was specified, and over all this was laid a layer of cement. Some time ago a leak was sprung in the roof, and on cutting down the cement we found the asphalt mastic intact, and in the same condition as when we laid it, but the paper had disintegrated and caused the leak.

I could tell you a number of experiences that I have had with waterproofing with paper and coal tar or asphalt compounds, but I simply wish to say that we give a guarantee with all our asphalt mastic work, but we refuse to give any guarantee with paper.

Another one of my experiences which I wish to cite you is in connection with the swimming pool for the Blind Asylum at Overbrook, near Philadelphia, which was to be built last summer in connection with the bowling alley. We bid on this work, and the contractor wanted us to build the pool, but our competitors bid so low that we could not possibly do the work at their price; hence we lost the contract. The first contractor did his work in such an unsatisfactory manner that the architect made him relinquish the contract. Another party next tried his hand with burlap and compound, but was so unsuccessful with his work that it leaked like a sieve and we were called in to do the job. We began by tearing out all the materials and lined the pool with asphalt mastic. We have now completed the work and we have guaranteed it for five years.

The new home of the Racquet Club is now being built in Philadelphia and between the third and fourth floors a large swimming pool is planned, for which we have the contract, and which we expect to line with asphalt mastic.

When waterproofing is to be done in places where there is considerable water pressure we find that there is only one method to pursue. While doing the work relieve the water pressure by pumping from a lower water level. Build your bottom and outer walls of sufficient strength to receive the asphalt mastic waterproofing or lining. Then build your concrete bottom and inner brick or concrete walls on top of the asphalt mastic lining and of sufficient weight to withstand the water pressure from without, and your task is done.

At the new Wanamaker building in Philadelphia we are building approximately 1,700 lineal feet of pipe ducts below the sub-basement floor which are almost completely submerged in water. We are building them in the manner above described with the best of success.

Fire-proofing and Insurance, was the subject touched upon by E. Cairns, whose report in its entirety will appear in a future issue.

FRIDAY EVENING SESSION.

The report of the Committee on Laws and Ordinances, by H. C. Henley, of St. Louis, contained a great deal of valuable instructive matter with regard to the steps necessary to secure the enactment of properly constructed ordinances to provide for the intelligent use of concrete in its various forms. A description was given of the progress made in the case of the ordinance provided by a committee composed of architects and engineers and recommended to the general council of the city of St. Louis for adoption.

The paper discussed at length the difference between the oft-quoted Philadelphia ordinance, the more recent ordinance provided for the city of New York and that now under consideration by the city of St. Louis. Nearly every member present was deeply interested in this subject, because, in some localities there has been found a distinct opposition to the employment of concrete in any kind of structural enterprise. This is one of the important features that the National Cement Users' Association now has before it to work out, and undoubtedly, a conservative, safe and perfectly satisfactory solution will soon be arrived at.

The features of the evening were the remarks of Richard L. Humphrey with stereopticon illustrations showing the equipment of the United States Geological Survey Laboratories at St. Louis, where the investigation of cement mortars and concretes is being conducted. Mr. Humphrey spoke directly from notes made in the routine of his regular work at the laboratory. He explained the method of molding, curing and testing of concrete blocks on all of the various types of molding apparatus and systems of treatment for curing.

He explains the thoroughness with which the tests are being conducted, so as to tabulate the actual results of crushing strength, tensile strength and transverse strength, at different periods of time from the molding of the block beginning with 30 days of age up to 360 days, so that the quality of concrete blocks made upon one stated set of specifications may be absolutely known. The method of molding, curing and testing of beams of various lengths employing different kinds of reinforcement was fully explained in much the same manner. The enormous expense of conducting such exhaustive experiments became clearly apparent to the audience by the photographs reproduced on the canvas of the buildings which have been constructed for laboratory purposes. There was no more interesting or instructive lecture in the whole course of the convention than this explanation of the government's great undertaking at St. Louis in which every member of this association is vitally interested.

At the conclusion of Mr. Humphrey's remarks a motion was unanimously passed to the effect that every member should request the co-operation of his Congressman, wherever located, to co-operate with and assist the work of the Geological Survey by continuing the government's support.

In the closing business session, C. C. Brown, chairman Committee on Resolutions, read his report suggesting a few trivial changes in wording of the constitution which were fully discussed and considered and disposed of in the usual way. Thus closed the sessions of the third annual convention and the members who had taken so much interest in the proceedings from the opening were even then loath to depart.

WE NEVER SLEEP.

Old Moses kept his headquarters at suite 822 Auditorium Hotel and a grand convention spirit pervaded the atmosphere continually. He was issuing daily Rock Products, and at the same time keeping open house with a never-ending reception. The visitors became assistant editors whenever they were needed: the supply of wet goods that makes Kentucky famous lasted until adjournment, and a ring for ice-water was the conventional thing when in doubt.

It was pleasant to see the throngs of competitors in all lines sitting side by side, each vying with the other to see who could be the best fellow.

As usual it was after the labors of the day were over that the wit and recreation of the bright minds that create the enterprise and progress of commercial endeavors, burst forth, and sometimes old Moses had to put up the sign of "Standing Room Only." But everybody knows that there was still a big welcome, even after the space got thin.

The entire Universal force was represented, including President E. M. Hager, B. F. Affleck, B. H. Raeder, who made a convention record for himself, E. A. Coates, our poet laureate, and S. D. Nelson, all from the Chicago office. Besides there were J. C. Van Doorn and Edward Quebeman from the St. Louis office.

The Lehigh crowd consisted of Col. C. T. O'Neill, Frederick E. Paulson and Bert Swett. They are all good editors, as well as famous salesmen of the Lehigh brand.

The Atlas Portland Cement Co. was represented by F. C. Boyer, P. Auesten Tomes, John G. Evans, F. W. Clayton and F. C. Bayley, who are known as the spreaders of "The Standard American brand."

The big red seal of the Whitehall was always in evidence, with Howard B. Green, from the home office, Edward G. Brick, C. P. Robinson and Harry F. Ransch, and each one is an accomplished mixer.

Frank C. Willbrand, sales manager of the Northampton Portland Cement Co., bears on his escutcheon the brave device, "Second to None."

Chicago A. A. Brand was well represented in the person of W. F. Main.

Genial Charley Johnson, secretary and manager of the Castalia Portland Cement Co., was a regular.

J. F. Locklev, the sales manager of the Newaygo Portland Cement Co., of Grand Rapids, composes poetry as fast as Byron, and some say it's better.

Bon mots there were in plenty, yet not so profuse as formerly, for A. Baumberger, who keeps a big Red Ring to represent the St. Louis Portland Cement Co.'s brand has sworn off from his favorite pastime of giving pink teas.

The Marquette brand exploited an invincible quartette in the persons of Robert B. Dickinson and W. H. Eccles, of the Chicago office, besides John Dunlop, of Madison, Wis., and E. E. Seaberger, of Cedar Rapids, Iowa.

A. L. Moyer, who is helping to work up the fame of Vulcanite, was a first nighter. His pleasant smile helped illuminate the occasion.

Edward S. Larned was in early and often. In spite of the fact that he was one of the hardest convention workers with many responsibilities, he was like the brand he represents, "The Old Reliable Giant."

Richard L. Humphrey, the president of the association, had his headquarters right next door to Moses, and was a real neighborly neighbor, even though continually on the go with a hundred and one things to think of.

Joe Kramer and Earl Gilbert, of Dayton, O., made themselves right at home, for are they not the most famous tool makers?

A. A. Pauly, M. G. Fleming and T. P. Behan represented the concrete interests of Youngstown, O. They never missed a bet; Youngstown people never do.

The Arthur Koppel Co., famous for industrial railways and dump cars, furnished three members of the charmed circle, Manager Otto C. Plessner, E. G. Aldrich and Philip J. Nash.

C. V. Walker, Jr., of the Chicago Pneumatic Tool Co., bobbed up serenely most any time.

The Perfection Power Block Machine was never absent, for either M. K. Sawyer or J. T. Summers could be seen. M. K. has been sawing away down East and J. T. has been pushing the business in the West all summer (Bang!).

Charlie Mankedick, of Sullivan, Ind., was the longest cement user at the convention. He had no trouble, however, for the ceilings of the Auditorium are notoriously high, but even the Chicago skyscrapers salaamed to Charlie.

F. B. Vary, of Atlanta, Ga., is studying the hard knots of the concrete industry.

Mr. and Mrs. P. P. Comoli, of Sioux City, Iowa, favored us with a short visit. Mr. Comoli's experience in cement work dates back to 1880.

Charles Weller, of the Western Lime and Cement Co., Milwaukee, Wis., came down to see the big cement show.

Frank Wright, of the supply firm of Meecham & Wright took a personal interest in all that was doing.

General Joseph W. Vance and Dr. Boyle Vance, of Springfield, Ill., arrived on the second day. The General says his concrete operations are constantly increasing.

Arthur W. Elsenmayer, of the Granite City Lime and Cement Co., Granite City, Ill., takes a deep interest in the development of concrete.

Robert McCarroll, of the McCarroll Compo Stone Co., Jacksonville, Fla., has worked out some ideas of his own that are counting in big numbers.

Clay M. Runyon, of the Runyon Concrete Machinery Co., Cleveland, Ohio, says his new factory is all complete and he extends a hearty invitation for everybody to call. Clay's heart is big enough to hold a continuous reception.

Theodore Schwer, of the E. M. Baltes Co., Fort Wayne, Ind., happened to be in Chicago and took in the Convention for the sake of its educational features.

Sid L. Wiltse, is a member of the Old Guard. He worked so hard every day with his exhibit, that he was glad to unwind with a little humour in the evening.

E. E. Evans, of Kansas City, was one of the members from Missouri. He has a machine called the X-L.

Maurice C. Tompkins, of the William B. Hough Co., Chicago, after making more noise all day than anybody else could with the big Ransome mixer, was inclined to take things easy in the evenings.

Harmon H. Rice is not only an impressive talker in the convention, but like most everybody else from Denver, has a good story besides.

We had a visitor by the name of H. C. Sense, from Lafayette, Ind. The name of his firm is the Sense Bros. Co. There are four of them in the firm; they are contractors, builders and manufacturers of cement material upon a large scale.

C. H. Schulz, of the Fort Wayne Cement Stone Co., Fort Wayne, Ind., says he has had a busy season with all the work he could possibly attend to.

C. E. Marks, Hot Springs, Ark., manager of the Hot Springs Concrete Co., says concrete building material is constantly growing more popular in his city.

William W. Birnstock, manager of the Standard Stone Co., York, Pa., remarks that they are getting all the business that they can well take care of. He shows a handsome catalogue of the work which they have completed in the operations of a single year.

F. K. Hogue, manager of the Flint Stone Co., Toledo, Ohio, says the demand for stone in concrete operations is constantly growing, which indicates the popularity of cement products.

There were J. W. Sanderson, J. F. Angell, J. A. McDowell and S. M. Coe, a machinery quartette from Columbus, that can't be beat. They have recently organized the big Cement Machinery Manufacturing Co., in conjunction with Harmon S. Palmer, who is now in England.

W. W. Sawyer, of Rockford, Ill., is in the rock plaster business, as well as an extensive manufacturer of cement, stone and brick.

J. W. Farrington, of the United States Gypsum Co., Ft. Dodge, Iowa, was in Chicago during the convention, and took in the sights, because he had the opportunity.

H. C. Miller, of the Concrete Association, of New York, arrived early, participated in every feature of the convention and went home highly pleased with the result.

R. W. Holden, of the Rochester Composite Brick Co., Rochester, N. Y., was taking in all the pointers that were floating around on the manufacture of brick and equipment.

August Radke, of Monroe, Mich., never missed any of the points that a well informed concrete man was entitled to pick up.

Ed Hotchkiss, president, and William S. Hotchkiss, secretary and treasurer of the Hotchkiss Concrete Stone Co., Chicago, didn't find much at the convention that they were not already acquainted with. They are right in the front rank in making good with a larger line of concrete building materials than anybody else in the great Chicago market.

Homer Knapp, of Rochester, N. Y., was picking up big chunks of concrete information at the convention and comparing the merits of the various machines on exhibit.

The block and brick manufacturing interests of Louisville were represented by Robert C. Morris and P. S. Hudson, of the Central Concrete Construction Co., W. A. Thomas, of the Home Building Co., and John A. Simon, of the Louisville Pressed Stone Co.

F. J. Fitzsimons, is now working his fine points as a salesman on the new Brandell machine, with headquarters at Chicago.

Benjamin L. Simpson, of Kansas City, is still interested in the concrete business, although his gold mining ventures take up most of his time these days.

L. V. Thayer, of Minneapolis, the Peerless Brick Machine man, says, "Just made another little record, that's all," with a merry twinkle in the corner of his eye.

What Father George L. Stanley, of Ashtabula, O., don't know about sidewalks is not worth mentioning.

Charles Artistic Watson, of Toronto, Canada, made a hit with the architectural division.

A. Monsted, Milwaukee, Wis., was shaking hands with all his old friends. He is one of the daddies of the Association.

Of course Merrill Watson, of New York, was on the floor of the convention most of the time, and when he wasn't he was doing a little thinking.

C. F. Bocquin, Ft. Smith, Ark., is a successful concrete operator, but came to see if there was any more valuable information to be picked up.

Joseph Bendt, Kenosha, Wis., says he is surprised at the progress that his own operations have made in the last year or two.

THE GREAT EXHIBIT FEATURE.

Perhaps there is nothing which marks the progress of any industry so forcefully as the development of machinery directed to its advancement. The Old Guard of the association who attended both the Indianapolis and Milwaukee conventions is bound to admit that the exhibit feature at Chicago shows a pronounced advance over anything that has been presented before.

It is true that the best concerns that took part in this feature at the first convention at Indianapolis, are still to be found on the muster roll and still in the front rank. Some that were mere experiments, have fallen by the wayside, because they were working on an impracticable proposition. The wild ideas that were prevalent and the "get rich quick" schemes have subsided to a great extent, and now the survival of the fittest becomes apparent on the part of the machinery manufacturers who have found that it is more profitable to miss the sale of a single machine than to have their goods go into the hands of incompetents who afterward prove to be a drawback to the industry in their special localities. These broad-minded men don't care so much for show, as for the records of profit that are regularly made by the people who purchase and use their machinery. There are still a few four-flushers who claim the whole earth and survive by means of intrigue to catch the sucker, but thanks to the work of the association, the crop of suckers is getting smaller all the time, and it is those men who honestly show their customers how to succeed with their line of machinery and follow them up until they do succeed, who will reap the great harvest of the future, in the practically limitless concrete industry.

At Milwaukee, the exhibits were so scattered that it was almost impossible to form any good comprehensive idea or make any comparison. At the Chicago convention, however, with all the exhibits under one roof, it was truly remarkable to observe what a large proportion of the exhibits really had an actual record of merit to substantiate their claims. There were not any new ideas presented, but the development and completion and improvement of the systems and methods for manufacturing concrete commodities and for handling concrete construction of the reinforced type was evident on every hand. The mixer feature was quite as prominent and perhaps more liberally exploited than at the Milwaukee convention, and the progress that has been made in this line is more pronounced than anything else. It will be recalled that at the Indianapolis convention, not a single mixer was on exhibit, although several models and blue prints of proposed machines were shown there. The exhibits in detail, are as follows:

Concrete Stone and Sand Co., Youngstown, O., represented by Manager A. A. Pauly, M. G. Fleming and T. P. Behan, showed one of Pauly's wall machines in position for operation, designed for the construction of cellar walls, basements and retaining walls without the use of cribbing or false work. They also exhibited a number of sample blocks made by Pauly's patented system of molding and steam curing concrete stone. These machines have been thoroughly proved out in practice for the past two years and being publicly exhibited for the first time, attracted no little attention.

The Indiana Road Machine Co., in charge of W. J. Roseberry, Jr., exhibited their Chicago concrete mixer.

The Anchor Concrete Stone Co., Rock Rapids, Ia., C. W. Bradley in charge, exhibited their machine manufacturing two-piece concrete blocks tied with galvanized wall-ties. Attachments are provided for making chimney blocks, porch columns and all the architectural requirements.

The Pettyjohn Co., Terre Haute, Ind., in charge of L. Pettyjohn, William Dunston, W. B. Abbey, R. E. Brooks, L. P. Dunn, showed a full outfit of the little machine that lies on the ground and rolls dollars into the till. They are making blocks all the time and many of their old friends came around to get more Pettyjohns.

The Arthur Koppel Co., Chicago, manufacturers of patent dump cars for concrete work, had on exhibit some of their best types of such cars. The exhibit was in charge of Otto C. Presser, E. G. Aldrich and P. J. Nash, who had a pleasant reception for every visitor.

The Chicago A. A. brand of Portland cement was represented by W. F. Main, who had a telephone handy for the use of visitors and a desk with stationery, which proved to be a convenience to the many visitors.

The Diamond Cement Machine Co., Deshler, O., in charge of S. A. Jones and E. A. Hoskinson, showed their diamond shaped shingle machine in operation, and as this is the most modern and attractive proposition now being considered by the industry, they were constantly favored with a large audience.

The Winner Cement Brick Co. exhibited their machine in operation in charge of John Miller.

Wetlauffer Bros. had an exhibit in charge of W. H. Buchanan, showing their "Lightning" brick machine in operation.

No-Damp Concrete Block Machine Co., Minneapolis, Minn., were represented by F. W. Tidhall and C. W. Brewster, and showed their two-piece block system for producing a completely water insulated wall.

The Cement Tile Machinery Co., Waterloo, Ia., in charge of J. H. Stewart, showed the Schenk Patent Drain Tile Machine in operation. It was the only thing of the kind on exhibit and attracted much attention.

The Sandusky Portland Cement Co., was represented by R. R. Fish and F. J. Morse, who were kept busy explaining the merits of Medusa waterproofing.

The Chase Foundry and Manufacturing Co., Columbus, O., had an exhibit in charge of S. M. Chase and W. C. Stocklin. They had an attractive exhibit of the ordinary pattern of block and brick cars and a miniature plant with working models showing how to use the Chase transfer trucks and complete equipment. This was a busy exhibit.

The Stevens Cast Stone Co. showed some samples of cast stone and were represented by C. W. Stevens and L. P. Biggins.

The Garden City Sand Co. had a nicely arranged booth.

The Northwestern Expanded Metal Co., Chicago, had an exhibit in charge of E. H. Jones, Arthur Eberling and C. F. Dynes. They had something entirely new in the way of expanded metal re-inforcing, which attracted the engineers especially interested in that branch of concrete construction.

The South Bend Machine Manufacturing Co., South Bend, Ind., had an exhibit in charge of H. H. Hudson, W. F. Keller and C. H. Lewis. They showed the well known standard brick machine in three different sizes and a pair of their mixers. The whole exhibit was driven by power and they were manufacturing brick throughout the entire convention.

The New Way Motor Co., had several of their air cooled gas and gasoline engines on exhibition, some of them driving the machines that were manufacturing concrete products.

The Contractors Supply and Equipment Co., Chicago, had a big exhibit in charge of Mr. Trevor right in the center of the great hall. They had the largest sized Smith mixer, driven by a gas engine, showing its operation in conjunction with the automatic charging elevator. The capacity of this full sized machine was more than a yard of concrete in a single batch and the automatic features of the elevator were favorably commented on by all the contractors present.

The Ironite Co. had old Shakespeare himself in charge.

The Atlas Portland Cement Co. had quite an attractive exhibit, showing the raw material, the clinker and the finished cement that is used to make the cement that goes under the "Atlas" brand. The exhibit was conducted something on the nature of a reception, and F. C. Boyer, P. Austen Tomes, F. W. Clayton, J. E. Evans and F. C. Bayly were the hosts by turns.

The Municipal Engineering and Contracting Co. had a cube mixer on exhibition in charge of T. M. Meek.

The National Concrete Machinery Co., Milwaukee, Wis., had an exhibit in charge of A. F. John, H. F. Burley and William Phillips. They showed the newly developed two-piece wall machine and the Phillips mixer.

The Sterling Wheelbarrow Co., Milwaukee, Wis., had an exhibit of concrete workers' barrows, in charge of C. A. Baker, who was kept busy all the time showing the merits of the different articles in his line.

The Perfection Block Machine Co., Minneapolis, Minn., were represented by M. K. Sawyer and J. T. Summers. They exhibited a large number of blocks recently made in different parts of the country on the Perfection power machine. In connection with their operation, they have recently developed and introduced a vapor curing system, which adds materially to the profit of the plant using their equipment.

The St. Louis Portland Cement Co., St. Louis, Mo., had our old friend, A. Baumberger in charge, who is their expert at telling just how good the Red Ring brand is for all kinds of concrete work.

The Chicago Builders Specialty Co. displayed a sign bearing the inscription "Everything in metal for buildings." H. W. Capron was in charge and they showed a very extensive line.

The Clover Leaf Machine Co., South Bend, Ind., had their celebrated "Clover Leaf" concrete mixers running in full blast. The exhibit attracted no end of attention and was in charge of W. O. Williams, C. E. Williams and C. E. Moore.

The White Cement Machine Co., showed their step molding device in charge of Mr. White himself and W. E. Brewer.

The Simplex Manufacturing Co. exhibited the Simplex brick machine in operation.

The Cement Machinery Co., Jackson, Mich., had an interesting exhibit in charge of Sid. L. Wiltse and quite a corps of assistants. They showed the latest economical developments in block machinery, besides several patterns of the Favorite brick machine. Sid. Wiltse demonstrated the fact that he can not only sell machinery, but can make the brick himself. Perhaps it is just as easy as it looks.

The Simpson Cement Mold Co., Columbus, O., represented by H. A. and B. L. Simpson, exhibited their ornamental molds for casting the architectural embellishments of buildings. They had quite an extensive exhibit of columns, caps, pedestals, etc.

F. W. Dunn & Co. showed quite a collection of concrete working machinery in charge of F. W. Dunn.

The United Cement Machinery Manufacturing Co., Columbus, O., had a mammoth exhibit, in charge of J. W. Sanderson, J. F. Angell, John McDowell, assisted by S. M. Coe, Charles E. Nicoud, Fay McDowell and John C. Mitchell. Several types of mixers were exhibited in operation and the block machines which the company control were all to be seen with practical demonstrators, consisting of the Palmer machine, Winget machine and the Chicago machine, besides a most complete assortment of accessories, such as pneumatic tampers, cars, cap and ball molds, name plates and weather-proof colors.

The International Fence and Fireproofing Co., exhibited their American mixer in several sizes, R. M. Campbell and J. M. Cunningham in charge.

Kramer Bros. Foundry Co., Dayton, O., exhibited a complete collection of cement workers' tools. The exhibit was in charge of Joe Kramer and Earl Gilbert. The practical concrete worker couldn't pass this exhibit any more than a young lady can get by a milliner's window without the

toothache. They all wanted to handle the tools, just to see how they fit the hand.

The Hayden Automatic Block Machine Co., Columbus, O., exhibited a full line of the well known Hayden machinery, consisting of block machines of several sizes, and Hayden mixers in operation. W. M. Scott, the inventor and general manager of the company, presided over the exhibit with his accustomed cordial manner. Mrs. Scott, for the first time, attended a concrete convention and expressed herself as being highly entertained with her observations.

The Clinton Wire Cloth Co., South Framingham, Mass., exhibited their line of re-inforcing materials. The exhibit was in charge of Robert Oliver and Chas. S. Fairbank.

The X-L Concrete Stone Co., Kansas City, Mo., exhibited their X-L block machine, off bearing truck, automatic tamper and curing process. E. E. Evans and F. S. Fipps did a rushing business showing those not from Missouri how they do it.

The Brandell Concrete Machine Co., Chicago, Ill., exhibited the newest block machine and they claim the fastest operation yet produced. It was exemplified by W. B. Myers, F. M. Benningson and F. J. Fitzsimons.

The Edmundson Concrete Machine Co., showed their two-piece wall machine and several blocks with different faces for the outside and plain inside blocks tied with wall ties. W. G. Elliott and J. H. Willen had it in charge.

W. E. Dunn & Co., Chicago, Ill., represented by W. E. Dunn, exhibited the Dunn hollow cement stone machine. He exemplified the workings of the machine and the many interested visitors made him talk until he was hoarse. It looked as if business was good.

R. J. Schwab & Son's Co., Milwaukee, Wis., who manufacture the famous basis Palmer block machine had an exhibit in charge of R. J. Schwab.

The Eureka Machine Co., Jackson, Mich., H. F. Abbott and R. L. Rhea in charge, exhibited the well known Eureka mixer and Mr. Abbott says that he was kept busy holding a continuous reception of contractors who use the Eureka. They also showed an automatic tamper for which they claim the same feature of reliability as developed in their mixer.

R. G. Snell Manufacturing Co., South Bend, Ind., showed the well known revolving cylinder type of mixer. Mr. Snell, the inventor presided over the exhibit.

The Ideal Co. displayed their usual large exhibit in charge of M. Weinstein and G. B. Pulfer. Frank A. Borst, formerly president of this concern attended the convention, although he has severed his connection with the company. He is one of the most successful inventors of concrete machines and the industry still needs him.

Century Cement Machine Co., Rochester, N. Y., had a practical and attractive exhibit, in charge of A. T. Bradley, Robert Seibert and O. D. Tiffany, besides other members of the organization at various times. The latest pattern of the well known Hercules machine was shown, as well as practical cap and column molds that were shown in the act of molding such ornamental work, just as it is done in the every day operation of the plant. Two walls constructed of Hercules blocks with coping and neat finished corners and angle blocks laid to show the way bay windows are constructed by the product of the Hercules machine were on exhibition. The exhibit was profusely decorated with flowers and evergreen, giving it an attractive gala appearance.

The Ashland Steel Range and Manufacturing Co. showed their United States standard block machine, which was all nickel plated, giving a handsome appearance. The exhibit was in charge of U. S. Shelley.

"Two Miracles" was the device done in electric lights. They are brothers, O. U. and R. O. They showed their usual extensive line and the attractive feature was a brick machine with an air compressor and pneumatic tamp that made bricks rapidly when operated by an expert. The compressor and tamp are manufactured by the

Chicago Pneumatic Tool Co. and the way that compressor whistled every little while would make you think the circus was coming.

The American Cement Roofing Co., was represented by J. E. Hicks, who also exhibited an automatic tamping device.

The Lehigh Portland Cement Co. had a neatly dressed booth where Col. C. P. O'Neil, Fred E. Paulson and Bert L. Swett, held a continuous reception. A little Lehigh barrel for a paper weight, a watch fob neatly gotten up and a combination pencil and pen, with which to sign orders for Lehigh Portland cement were given away as souvenirs.

A. D. MacKay & Co., the well known Chicago sales agents for cement machinery, exhibited two specialties in the shape of the Star block press and the Diamond roofing tile machine.

The William B. Hough Co., Chicago, Ill., were represented by William B. Hough, M. G. Tompkins and O. A. Kreutzberg. Here is where the famous Ransome mixer lived, as well as the Ransome re-inforcing bars, besides accessories and implements of every kind for the convenience of the concrete contractor. There was about a yard of pebbles and sand which were thrown into the big revolving mixer, so that the visitors could see exactly how it worked. It was never lonesome around the Hough exhibit, for they made as much noise as the Fourth of July, when the dry pebbles struck the iron walls of the concrete mixer. It was good advertising, for you had to look that way in spite of yourself.

The Whitehall Portland Cement Co., Philadelphia, had a booth decorated with the big red seal of the "Whitehall" on high, like the rising sun in the East, and the sales department was well represented by Howard B. Green from the home office, Edward G. Brick, of the Boston office, C. P. Robinson, from Atlantic City and Harry P. Rausch, of Columbus. No better fellows could be found in all Tattersalls and the match safe and card case presented as souvenirs of the occasion were tasty and highly appreciated by the recipients.

The Besser Manufacturing Co. exhibited their line of "Eureka" block, brick and tile machines.

The Expanded Metal and Corrugated Bar Co. not only exhibited samples of their re-inforcing bars, but a whole collection of pictures showing the important re-inforced work in which their bars had been used. W. C. Berry was in charge.

The Automatic Concrete Machine Co. exhibited an entirely new block machine.

The Knickerbocker Co., with father R. B. Colt in charge, exhibited the Coltrin concrete mixer in operation.

The Peerless Brick Machine Co., Minneapolis, Minn., with L. V. Thayer and P. Murphy in charge, repeated the success that they made last year with the Peerless brick machine, which was exhibited in operation and which attracted many interested purchasers. Mr. Thayer remarked, "In exceeding my past record, I feel like I have been at work."

The Marquette Cement Manufacturing Co. had a handsomely decorated booth, where R. B. Dickinson, W. H. Eccles and other members of the sales organization entertained their visitors and friends continuously. They deserve no little credit for the part they took in assisting the efforts of the Association.

The Fisher Hydraulic Stone Machine Co., Baltimore, Md., for the first time made a public exhibition of the ponderous machine which constitutes their system of manufacturing concrete blocks by the use of hydraulic pressure. The concern was represented by W. H. Fisher, the inventor, John P. Bullington, Daniel A. Leonard, E. A. Parsons, the Chicago representative, and Stephen M. Wright, the Memphis representative. The big power machine in operation attracted the attention and investigation of every visitor in the great exhibit hall. It was really something that had to be seen to be thoroughly understood.

The Ballou Manufacturing Co., Belding, Mich., had their exhibit in charge of Harry Ballou, A. L. Marvin and J. C. Jennings. The famous "Little

Giant" mixer was the machine exploited and it is already well known to a large number of contractors.

The Northwestern Steel and Iron Co., Eau Claire, Wis., had an exhibit in charge of J. H. Holm and A. Emery. They showed a complete line of ornamental molds, besides block machines and concrete mixers.

The American Hydraulic Stone Co., Denver, Col., exhibited their old established system of two-piece wall construction. Harmon H. Rice, secretary of the company, was in charge, assisted by the sales manager, W. J. Scott. The blocks made by what is known as the Ferguson system have been in use for a number of years and have a considerable following with the trade which is growing all the time.

The Coltrin Manufacturing Co. had a booth in charge of C. C. Spelling and C. J. Boos, where they exhibited the Coltrin block machine, which is represented in the southern territory by the Newsome Crushed Stone and Quarry Co., Nashville, Tenn., where it has earned no little success.

The Barrett Manufacturing Co. displayed their patent roofing and water-proofing material and C. P. Goody, who presided, had many interested callers.

The Standard Concrete Machine Co., Kent, O., personally represented by A. M. Post, F. A. Kershaw and E. L. Barber, showed the highly esteemed Standard continuous concrete mixer, which is designed to regulate absolutely the proportions of the concrete mix. Few, if any, of the knowing ones passed by this exhibit without investigating.

Blaw Collapsible Steel Centering Co., Pittsburgh, Pa., displayed something entirely new to many of the visitors, consisting of sheet metal drum circular or oval for the purpose of molding culverts and sewers of all dimensions in five foot sections. A part of the exhibit consisted of a section of concrete cast the day before the exhibit opened in which the collapsible tube still rested, so that the visitors could understand exactly how the system worked. Jacob B. Blaw, the inventor and patentee, was on hand to explain the practical workings of his invention, assisted by A. J. Lowry, their Chicago representative. This exhibit marks a distinctive advance in the manipulation of concrete in sewer construction and attracted much attention.

The Multiplex Concrete Machine Co. occupied booth No. 84 to display their machine.

The Dykema Co., exhibited their wet process block machinery by the explanations of clever Frank Dykema.

The Hartwick Machinery Co., displayed the Sheffield proportioning mixer, which they claim has made a good record.

The Universal Portland Cement Co., Chicago, Ill., had a big double booth where they kept open house throughout the exhibit period. B. H. Rader, who has developed a reputation as a convention expert was on hand most of the time, and then there was the whole staff of the good fellows who represent the Universal sales department, including B. F. Affleck, J. C. Van Doorn, Edward Quebbemann, E. A. Coats, J. L. Nelson, H. MacRobert and A. E. Robinson.

Stumpf & Richards exhibited a number of brick made upon their power brick press, which is specially designed for manufacturing concrete brick at a speed and upon a scale to compete with common clay brick. Their motto is "40,000 brick a day on one machine."

J. A. Noble, Fostoria, O., exhibited a block machine of his own invention and made blocks steadily of solid character.

The Popular Block Machine Co. was the only machine exhibited that was marked with the price in plain figures, and called the "Yellow Fellow." It was represented by A. L. Jones.

Bovie's re-inforced concrete facing plate system for putting cut stone facing upon re-inforced or monolithic concrete walls, was a new idea developed by the practical workings of the contractor who is familiar with the use of ordinary centering propositions.

Standard Instructions Needed.

Perhaps the most important single point brought out in the discussions at the Chicago convention, were the remarks of Edward S. Larned, of Boston, upon the subject of uniform instructions in concrete construction, bearing upon the mixture and manipulation of the concrete, the amount and disposition of re-inforcement, the construction and handling of centering forms, and the method for seasoning or curing of bricks, building blocks, paving or roofing slabs and columns or ornamental details. It was readily recognized that in the absence of exhaustive and carefully tabulated comparative tests, with every kind of known prepared materials, that a number of contractors working upon the same set of specifications would find just as many results as there would be contractors. In the absence of such definite knowledge as could only be acquired by means of such tests, it is easy to see that if all contractors figuring on a given set of specifications were working out their equation upon a set of accepted, uniform instructions, they would all arrive at approximately the same result in their calculation. In this way, the character and grade of concrete work of every description would be greatly improved and naturally more closely approach uniformity.

It would be a good thing if possible, for the National Association of Cement Users to carefully formulate and adopt, a full set of instructions covering all the branches of concrete work and furnish the members with such Association instructions which would soon become standard throughout the country and tend in a great measure to the standardizing and consequent general improvement and elevation of concrete as a structural material in every part of the country.

While the discussions of the subjects in question on the floor of the convention, clearly indicated that there are well defined differences of opinion, yet there is no great divergence when all are brought together for the consideration of any one specific point. The association instructions should be made in such a way as to use in practice the sum of all the good ideas that have been developed, and not the middle course between the extremes, for all the theories that are tried and found wanting should be promptly discarded, while every improvement should be fully considered and preserved.

The almost impossible proposition of securing uniform aggregate material for the making of concrete prevents the possibility of uniform concrete everywhere but under definite uniform instructions all of the concrete in any given locality would be made alike and for all practical purposes, a known product.

Two Important Definitions.

The following two important definitions for the use of the trade in the future were developed at the Chicago convention:

The term "Concrete" should never be used except when the composition described contains crushed rock, pebbles or coarse gravel combined with sand and where cement is used as a binder.

Where sand only is used together with cement, you should say a cement mortar block, a cement mortar brick, a cement mortar column, cap or lintel as the case may be, and either of these, may have the term "re-inforced" should there be an iron or steel member inserted for the purpose of giving structural strength in either direction.

Mixing and Seasoning.

All the discussions and nearly every paper bearing upon the practical production of structural concrete in any of its forms, unreservedly endorses what this paper has published with regard to the complete mixing and careful seasoning of concrete and cement mortar products. You can't mix concrete too thoroughly, and you can't be too careful about the curing and finishing of concrete work.

At the National Capital.

While in attendance at a convention held in Washington, D. C., last month we took occasion to spend a few hours with our friend, S. D. Lincoln, of the National Mortar Co. Mr. Lincoln has been in the building supply business some years, and was inquiring, immediately upon our appearance, as to when the National meeting will be

held. We advised him that unfortunately the executive committee thought it wise to keep Louisville of the map this year and selected Columbus, Ohio, and the Southern Hotel as the place of meeting. We told him about the good people of that city, and especially the hospitality that they aim to extend to all visitors, but especially to building supply men; because they have as active a lot of men in the business there as you will find anywhere, and as Columbus is different from several of the State capitals and is a very active city, there will certainly be something doing.

Mr. Lincoln, in speaking of business conditions at home, remarked that they have had a busy year. We are in a position to agree with him for, accompanied by A. T. McDonald, of the *Louisville Herald*, we wanted to see what Washington was doing and an automobile gave us the opportunity in a short time at that. One thing noticeable in the big capital was the large number of apartment houses under course of construction, and we were surprised to see the great amount of brick being used, special shapes and colors predominating. Then we were reminded as we passed the new apartment house built by Harmon S. Palmer that the architects of Washington could well spend some of their energy by specifying cement, for Washington, sooner or later, will use much concrete and block construction. We know they are not so far behind right this minute, for Brother Lincoln in his conversation remarked that he had already sold a hundred thousand barrels of Portland cement for side walk for next year's delivery, and a hundred thousand barrels were going in a new building near the Pennsylvania depot which was in course of construction, and will take a hundred thousand yards of sand and gravel as well, and probably by this time has landed enough orders for cement for 1907 to take the output of the small mill, for he is in close touch with Uncle Sam, and when the latter needs cement for construction in his particular lines, the old gentleman generally sees that Brother Lincoln gets his share of the business.

Mr. Lincoln has built this year a new warehouse and dump-track where the Government delivers trap rock from their quarries for building operations, and by the way we were reminded, as we were whizzed along two great Government buildings, of the new edifices in course of construction for the Senate and new structures for several important departments, and we know that it takes a man with a pocket book, like that carried by Uncle Sam, to pay the bills for all these Government buildings.

Washington is prosperous and will be one of these days the most beautiful city in the world. Dealers in all varieties of high class building material from all parts of the country are anxious to get a contract for the new buildings in course of construction or projected, and when the beautiful scheme laid out by D. H. Burnham and other architects had been carried out, there will be no city in the world that will eclipse it, notwithstanding the Kaiser's ambition to make Berlin, Germany, the second largest city in the world.

One of the finest warehouses built recently in northern Ohio is the new \$25,000.00 pressed brick building of the George Crisp & Son, supply and contractors, of Akron, Ohio. The structure is 225 feet long by 44 feet wide and five stories high. One of the large jobs just completed by this firm was the new viaduct of Akron. The viaduct proper is 700 feet long, with two wings, one 161 feet long and the other 180 feet. The substructure cost \$60,000.00 and 8,000 barrels of Diamond cement was used. They also handle Vulcanite cement, Marion, Ohio, lime, and Buckeye sewer pipe and Mineral City, Ohio, fire brick.

The Akron Supply Co., of Akron, Ohio, are in a very peculiar position at present as well as a very inconvenient one. They have a fine three-story building which, until a few months ago, was very well located, but a viaduct some 20 feet high has been built directly in front of their building, making it very hard to go in or out of the building from the street. But this handicap does not seem to conflict with their business to any great extent with the exception of the "one sack five-pound trade."

W. T. Acres, general manager, reports their business satisfactory with bright prospects for spring. At present they are handling Lehigh, Sandusky and Whitehall cement, Houston, Pa., lime, and Robinson sewer pipe. Mr. Acres is also manager of the Akron Brick and Tile Co. They manufacture solid and hollow shale brick. They have a capacity of 30,000 brick a day and employ about twenty men. The entire plant was equipped by the Bonnot Co., of Canton, Ohio.

Northwestern Cement Products Association.



DELEGATES TO NORTHWESTERN CEMENT PRODUCTS ASSOCIATION IN FRONT OF ARMORY BUILDING, ST. PAUL, MINN.

The third annual convention of the Northwestern Cement Products Association was held in St. Paul, Minn., January 16 and 17 and proved to be one of the most interesting sessions ever held by the organization. Many who attended the Chicago convention of the National Cement Users' Association also attended the St. Paul convention and there was at all times a marked interest in the sessions. St. Paul business interests in appreciation of the selection of St. Paul as the place of meeting secured free use of the fine new Armory building for the organization. The entire main floor, which is used for drill hall, was devoted to exhibits, which were many and very interesting from an educational point of view. The sessions of the convention were held in the large assembly hall.

The Wednesday morning session of the convention was called to order at 11 o'clock by President C. A. P. Turner, who was presented with a gavel by the Boy's Manual Training School, of St. Paul. He expressed his appreciation in a few well chosen words. President Turner said that his address would be delivered at the afternoon session.

A feature of the afternoon session which began at 3:15 was a visit paid by many members of the Northwestern Lumbermen's Association, which at the time was holding its annual convention at Minneapolis. They came to the convention in special cars and under the leadership of President Burnside and Secretary Hollis inspected the exhibits. The address of welcome was delivered by Louis Betz, city controller of St. Paul, and O. U. Miracle, former president of the association, responded on behalf of the cement users. After humorous remarks concerning the absence of a lid in St. Paul Mr. Miracle pointed out the immense strides that have been taken in the cement products industry and said that it is now the most important factor in industrial life. He referred to the enormous increase in the production of Portland cement and said that tests made at Ames College, Ames, Ia., had demonstrated that the poorest concrete block turned out in 1906 was better than the best block made three years ago. Following Mr. Miracle's address the following committees were appointed:

Committee on Resolutions.—Mr. Burgess, E. C. Schmidt, H. A. Rogers.

Committee on Nominations.—Martin T. Roche, Wm. Hurst, O. U. Miracle.

Committee on Location.—Lee Stover, F. A. B. Paterson, John Lauritzen.

President C. A. P. Turner then read his annual address which was heard with great interest and contained many points of advantage to the industry. He emphasized the fact that inferior, low grade work is hurtful to the industry and made a plea for a standard product. He discussed various building ordinances as far as they affect reinforced concrete at great length.

Following President Turner's address Ralph Burnside, president of the Northwestern Lum-

bermen's Association, was introduced and presented the greetings of his association to the cement users. He said he hoped the call would be mutually beneficial. Charles L. Johnson, of the Castalla Portland Cement Co., Sandusky, O., then read an interesting paper on the "Manufacture and Marketing of Portland Cement." The session for that day then closed.

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Lee Stover, Watertown, S. D., president.

Martin T. Roche, St. Paul, secretary.

Vice presidents and executive committee: A. H. Laughlin, Lisbon, N. D.; O. U. Miracle, Minneapolis; C. A. P. Turner, Minneapolis; John Wunder, Minneapolis, and William Simpson, Mandan, N. D.

J. M. Hazen, Minneapolis, treasurer.

The date and place of the next meeting was left to the executive committee who will make a report at some later date. It will probably go, however, to one of the Twin Cities as heretofore.

The affairs of the association are in splendid shape and it was the consensus of opinion of all those in attendance that the Northwestern Cement Products Association will continue to thrive and prosper under the present officers.

It now rivals in importance the National Convention and was the means of bringing about more good fellowship and a closer relationship between the producer and the consumer than any other convention. Nothing but compliments on all sides was heard for the able management of the association and Mr. Martin T. Roche, the able secretary was overwhelmed with congratulations and could have had almost anything he asked for so great was the enthusiasm. A motion to give him \$100 as a slight appreciation of his services was promptly put down by Mr. Roche himself who is averse to accepting any remuneration for his services. In fact the character of the work he has done in perfecting the affairs of the association and the conduct of the exhibition was the kind of work which can not be purchased at a price. An assistant secretary will be a great help in relieving Mr. Roche of part of the routine work.

One of the important steps taken was the adoption of a resolution presented by the commit-

tee on questions and resolutions which requests the federal government to continue chemical analysis of cement products as to general fitness for use in large buildings. With the rapidly increasing price of lumber, together with the shortage which is becoming more marked each year, the members of the Cement Products Association feel that this is the cement age and they look for great things in the near future.

On the last night two illustrated lectures were delivered. C. A. P. Turner, of Minneapolis, talked on "Re-Inforced Concrete Construction" and J. H. Freund, of Waupun, Pa., addressed the meeting on "Cement Roofing Tile." Both talks were illustrated by lantern slides showing the construction of cement from sand and water.

The following is an incomplete list of those in attendance:

R. B. Dickenson, Chicago.
Harvey B. Smith, Minneapolis.
Martin T. Roche, St. Paul.
Jas. L. Alton, Alexander, Minn.
Maskell Ewing, St. Paul.
Lee Stover, Watertown, S. D.
Ricketson Mineral Paint Works, Milwaukee.
Chicago Portland Cement Co.
W. T. Full, Ellendale, N. D.
South Dakota Concrete Construction Co., Brookings.

G. Scheurenbran, Mitchell, S. D.
L. Coffield, Annandale, Minn.
Frank O. Monaghan, Alpena, Mich.
John Monaghan, Alpena, Mich.
C. H. Reynolds, Alpena, Mich.
Herman Besser, Alpena, Mich.
William K. Johnson, Alpena, Mich.
Edward T. Marshall, Claremont, Minn.
J. B. Nelson, Mankato, Minn.
No-Damp Concrete Block Machine Co., Minneapolis.

J. V. Godfrey, Moorhead, Minn.
J. A. Ludington, Bemidji, Minn.
Rogers Lumber Co., Minneapolis.
T. R. McCormick, Sandstone, Minn.
John H. Engstrom, Litchfield, Minn.
Geo. W. J. Carpenter, Watertown, S. D.
G. V. Clark, Little Falls, Minn.
Fowler & Pay, Mankato, Minn.
Frank L. Kellogg, Cleveland, N. D.
T. T. Stuverud, Elbow Lake, Minn.
G. P. Pierce, Hinckley, Minn.
John Hopwood, Menominee, Wis.
Geo. L. Durkee, Cloquet, Minn.
J. A. Anderson, Ortonville, Minn.
L. C. Stenquist, Oakes, N. D.
Dave Hage, Detroit, Minn.
D. S. Whittemore, Detroit, Minn.
Wm. S. Hewett, Minneapolis.
C. P. Getchell, Wales, N. D.
Wm. Hurst, Glendive, Mont.
P. C. Hanson, Springfield, Minn.
C. Arveson, Springfield, Minn.
L. J. Thompson, Minneapolis.
H. A. Rogers, Minneapolis.
Martin L. Olson, Lake City, Minn.

R. E. Robbert, St. Paul.
 Kansas City Portland Cement Co.
 D. P. Faus, Waterloo, Iowa.
 Anton Everstad, Lakota, N. D.
 W. F. Riedell, Rochester, Minn.
 W. P. Cerbett, New York.
 C. A. P. Turner, Minneapolis.
 W. J. Laird, Wilmet, S. D.
 Chas. Massey, Baltimore, Md.
 L. J. Lund, Wadena, Minn.
 Eric Norton, St. Paul.
 Theodore Koch, St. Paul.
 Arthur Leahy, Minneapolis.
 R. O. Miracle, Minneapolis.
 B. F. Affleck, Chicago.
 R. R. Lish, Fort Wayne, Ind.
 F. J. Morse, Chicago.
 Chas. W. Bradley, Rock Rapids, Iowa.
 John Lauritzen, Fergus Falls, Minn.
 Thos. Berge, Fergus Falls, Minn.
 J. F. McGuire, St. Paul.
 Wm. Seafert, Chicago.
 John H. Engstrom, Lakefield, Minn.
 O. U. Miracle, Minneapolis.
 N. G. Rhodes, St. Paul.
 C. B. McVay, Yankton, S. D.
 Wm. Dunson, Terre Haute, Ind.
 L. P. Dunn, Terre Haute, Ind.
 Stevens Cast Stone Co., Chicago.
 B. F. Lippold, Louisville, Ky.
 W. E. Irish, St. Paul.
 T. M. Meek, Chicago.
 E. J. Sigwald, Portage, Wis.
 Frank C. Jennings, Belding, Mich.
 Geo. A. Fargher, Chicago.
 W. A. Wigdale, Milwaukee.
 Chas. P. Johnson, Glenwood, Minn.
 Elmer H. Mischo, Detroit, Minn.
 F. B. Chapin, Detroit, Minn.
 Chris. Arneberg, Miles City, Mont.
 Theo. Schumm, Arlington, Minn.
 E. C. Schmidt, Chicago.
 John Carlen, Havana, N. D.
 W. A. Carlen, Havana, N. D.
 Halvor Severson, Inwood, Iowa.
 Carl Otis, Lindstrom, Minn.
 A. M. Ferry, Cleveland, O.
 Geo. M. Crume, Cando, N. D.
 John Sandquist, Stillwater, Minn.
 F. D. Gould, Fairmont, Minn.
 Robertson Cook, Milwaukee.
 Fred C. Koehne, Sleepy Eye, Minn.
 John Larson, Mankato, Minn.
 A. W. Rydeen, Marshall, Minn.
 M. M. English, Marshall, Minn.
 J. C. Carpenter, Watertown, S. D.
 D. W. Bradley, Watertown, S. D.
 R. L. Eddy, Watertown, S. D.
 R. D. Turpen, St. Paul.
 Anton Evenstad, Lakota, N. D.
 O. B. E. Kinan, Roseau, Minn.
 T. A. Mair, Brookings, S. D.
 F. F. Lincoln, New York.
 Wm. Rahfuss, La Crosse, Wis.
 M. P. Mortonson, Cokato, Minn.
 Nils Erickson, Minneapolis.
 E. A. Dow, Minneapolis.
 N. P. Peterson, Owatonna, Minn.
 Eric Bjorkman, Dawson, Minn.
 W. A. Boyd, St. Paul.
 H. G. Kroning, St. Charles, Minn.
 W. E. Fox, New Hampton, Iowa.
 T. M. Thompson, Glenwood, Minn.
 D. L. Bell, St. Paul.
 Geo. C. Currie, Boisesevain, Man.
 Robert Heilman, Marshall, Minn.
 M. G. Rogers, Newton, Iowa.
 John Wunder, Minneapolis.
 W. B. Watschke, Minneapolis.
 S. O. Mason, Redwood Falls, Minn.
 D. W. Radichel, Lake Crystal, Minn.
 Geo. Gabler, Mason City, Iowa.
 E. E. Durkee, Cloquet, Minn.

SEEN AT ST. PAUL.

The Universal Portland Cement Co., of Chicago had an attractive booth. A. E. Robinson, of the sales department, was in charge of the exhibit. The Guarantee Cement and Stone Co., the Northwestern sales agents for Universal, with office at 221 South Fifth Street, Minneapolis, combined with them and some of their representatives were present.

G. E. Ingersoll, the Northwestern agent of the Contractors Supply and Equipment Co., of Chi-

cago, had charge of their exhibit, which consisted of one of their well known Smith concrete mixers.

The United Cement Machinery Manufacturing Co., of Columbus, Ohio, had an interesting display of their various makes of concrete machinery. This was practically the same exhibit which this company had at the Chicago convention. There was always a crowd around this exhibit which was one of the most attractive in the entire hall. J. L. Shannon and H. L. Green were in charge of the exhibit.

The South Bend Machine Manufacturing Co., of South Bend, Ind., had a display consisting of their well known Standard cement brick machine, their Standard concrete mixer and their Standard gas engine. C. H. Lewis had charge of the exhibit assisted by Earl Winnie. There was always a crowd around the exhibit. Mr. Lewis expressed himself as well pleased with the convention.

The Cement Tile Machinery Co., of Waterloo, Iowa, had one of the most interesting displays on the floor. There are many money making possibilities in the cement working industry, but none presents a greater field of endeavor for progressive men than the manufacture of cement tile. Cement drain tile have proven superior to any others. They are porous, strong and durable, and absorb the moisture better than any other material. It is claimed that 3,000 tile can be made in a ten-hour day on one of these machines. The machine works with clock-like precision and held the interest of the visitors. They can make drain tile on this machine in seven sizes, 4, 5, 6, 7, 8, 10 and 12 inches in diameter—12½ inches in length, making just sixteen to the rod. One of the features of the machine is that one size can be produced just as fast as another. The machine also has molds for making small hollow building blocks. The display was not only one of the most interesting, but one of the most unique in the hall. Mr. Schenk, the inventor of the machine, and W. H. Stewart were on hand in behalf of the Cement Tile Machinery Co.

The Chicago Portland Cement Co. had an exhibit in charge of E. C. Schmidt. Their fine Havana cigars were much appreciated by the delegates.

Fairbanks, Morse & Co., had one of their cement testing machines on exhibition and it attracted considerable attention.

Nels Erickson represented the Medium Hollow Block Machine Co., of Minneapolis. He had several machines in operation showing the method employed in making cement blocks.

The Atlas Portland Cement Co., as usual had a decidedly attractive display. They gave away some handsome souvenirs, which were much prized by the visitors. Their catalogue and booklets were also in demand as they contain much practical information for the concrete operator. F. N. Clayton, of Chicago, F. E. Bayley, of Milwaukee, and Frederic E. Potter, the general sales manager from New York, were in attendance.

Martin T. Roche, secretary of the Northwestern Cement Products Association, is also the Northwestern sales manager for the Alpena-Portland Cement Co., of Alpena, Mich. They gave away handsome paper weights and aprons for cement users besides some interesting literature on cement. Their exhibit was popular.

The Pettyjohn Co., of Terre Haute, Ind., had several of their machines on hand. Their slogan, "We move the machines and not the blocks" was demonstrated in an effective manner. L. P. Dunn and Wm. Dunson were in charge of the exhibit and expressed themselves as highly pleased with the exhibition and wrote many orders.

The Marquette Cement Manufacturing Co. had a display in charge of R. B. Dickinson and J. A. Dunlap. They gave away cigars, pencils and pocket mirrors besides some interesting reading matter about their well known brand of cement.

L. O. Beaudet had a small model of his concrete elevator on exhibition which attracted no end of favorable comment. Mr. Beaudet lives at Mendota, Minn. He has already placed several of his elevators in Minneapolis, where they are giving satisfaction. The device is protected by patents. Mr. Beaudet has a good thing and knows it.

Handsome silver loving cups suitably engraved were presented as follows:

1—Best Display Booth—Expanded metal and Corrugated Bar Co., St. Louis, Mo.

2—Best General Display of Cement Equipment Machinery—Miracle Pressed Stone Co., Minneapolis, Minn.

3—Most Attractive Cement Brick—Peerless Brick Machine Co., Minneapolis, Minn.

4—The Most Unique Concrete Product Exhibit—The Blow Collapsible Steel Centering Co., Pittsburgh, Pa.

5—Best Display of Cement Block Work—National Stone Co., Minneapolis, Minn.

The Sandusky Portland Cement Co., of Sandusky, Ohio, had a display of their Medusa Waterproof Compound in charge of R. R. Fish and F. J. Morse. Both were pleased with the results of the show and made quite a number of sales.

The Flour City Concrete Block and Machine Co., Minneapolis, were much in evidence at the convention. They had several of their machines in actual operation and made quite a number of sales. Mr. Steele and E. P. Elliott were in charge of the exhibit. This machine has several unique features not possessed by any other on the market to-day and has met with wonderful success. Blocks made on this machine have a continuous air space and are tied together with a wood binder perfectly dry and treated with a preparation of their own, which is said to make it fire and water proof.

The Stevens Cast Stone Co., of Chicago, had an exhibit of their manufactured product in charge of Mr. Stevens.

The Expanded Metal and Corrugated Bar Co., of St. Louis, Mo., had an exhibit which attracted considerable attention. It consisted of a series of photographs illuminated showing various bridges and buildings either in course of construction or completed in which their materials were used. They also had several kinds of corrugated steel bars on exhibition and presented the visitors with a small sample bar. W. C. Berry had charge of the exhibit and explained to the callers the merits of their product. After leaving St. Paul Mr. Berry went to the Ames Convention.

The Northwestern Lime Co., of St. Paul, wholesalers of building material, had a display in connection with the Atlas Portland Cement Co. F. M. Williams, secretary of the company, and R. D. Turpen were in charge of the exhibit.

The Wisconsin Portland Cement Co., had one of the most attractive booths in the hall in charge of F. H. Merrell, the secretary. David Strech, E. J. Sigwalt and Geo. Barrowman. This company was organized January 12, 1905, and is incorporated under the laws of Wisconsin for \$750,000.00. They expect to commence building the plant in the spring and will have some cement to offer by next fall. The plant will be located near Portage, Wis.

The Winner Block Machine Co., of Minneapolis, had a display of their machine in charge of John Miller. Their machine makes a hollow brick which is an innovation in cement bricks. They also make a block machine. Both were shown in operation. Mr. Miller was much pleased with the convention and made several sales.

The Besser Manufacturing Co., of Alpena, Mich., had a display of block machines, sewer tile machines and drain tile machines. W. R. McPhee, their St. Paul representative, demonstrated their machines. Eureka Concrete Machinery has become well known to the concrete operators in all parts of the country. Mr. McPhee said he was glad he had come to the exhibit, and that they had come out first rate.

J. N. Campbell represented the International Fence and Fireproofing Co., of Columbus, Ohio. He was kept busy explaining the merits of their machines to the many visitors. Their display was one of the most interesting in the entire hall and many thought it should have had a prize.

The Felt and Tarrant Manufacturing Co., of Chicago, had a display of Comptometers in charge of W. B. Matschke, of Minneapolis. These machines are almost human. Two very pretty girls operated the machines and it was difficult to determine which made the bigger hit, the machines

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L. Coffeld, Annandale, Minn.
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G. V. Clark, Little Falls, Minn.
Fowler & Pay, Mankato, Minn.
Frank L. Kellogg, Cleveland, N. D.
T. T. Stuverud, Elbow Lake, Minn.
G. P. Pierce, Hinckley, Minn.
John Hopwood, Menominee, Wis.
Geo. L. Durkee, Cloquet, Minn.
J. A. Anderson, Ortonville, Minn.
L. C. Stenquist, Oakes, N. D.
Dave Hage, Detroit, Minn.
D. S. Whittemore, Detroit, Minn.
Wm. S. Hewett, Minneapolis.
C. P. Getchell, Wales, N. D.
Wm. Hurst, Glendive, Mont.
P. C. Hanson, Springfield, Minn.
C. Arveson, Springfield, Minn.
L. J. Thompson, Minneapolis.
H. A. Rogers, Minneapolis.
Martin L. Olson, Lake City, Minn.

R. E. Robbert, St. Paul.
 Kansas City Portland Cement Co.
 D. P. Faus, Waterloo, Iowa.
 Anton Everstad, Lakota, N. D.
 W. F. Riedell, Rochester, Minn.
 W. P. Corbett, New York.
 C. A. P. Turner, Minneapolis.
 W. J. Laird, Wilmet, S. D.
 Chas. Massey, Baltimore, Md.
 L. J. Lund, Wadena, Minn.
 Eric Norton, St. Paul.
 Theodore Koch, St. Paul.
 Arthur Leahy, Minneapolis.
 R. O. Miracle, Minneapolis.
 B. F. Affeck, Chicago.
 R. R. Lish, Fort Wayne, Ind.
 F. J. Morse, Chicago.
 Chas. W. Bradley, Rock Rapids, Iowa.
 John Lauritzen, Fergus Falls, Minn.
 Thos. Berge, Fergus Falls, Minn.
 J. F. McGuire, St. Paul.
 Wm. Seafert, Chicago.
 John H. Engstrom, Lakefield, Minn.
 O. U. Miracle, Minneapolis.
 N. G. Rhodes, St. Paul.
 C. B. McVay, Yankton, S. D.
 Wm. Dunson, Terre Haute, Ind.
 L. P. Dunn, Terre Haute, Ind.
 Stevens Cast Stone Co., Chicago.
 B. F. Lippold, Louisville, Ky.
 W. E. Irish, St. Paul.
 T. M. Meek, Chicago.
 E. J. Sigwald, Portage, Wis.
 Frank C. Jennings, Belding, Mich.
 Geo. A. Fargher, Chicago.
 W. A. Wigdale, Milwaukee.
 Chas. P. Johnson, Glenwood, Minn.
 Elmer H. Mischo, Detroit, Minn.
 F. B. Chapin, Detroit, Minn.
 Chris. Arneberg, Miles City, Mont.
 Theo. Schumm, Arlington, Minn.
 E. C. Schmidt, Chicago.
 John Carlen, Havana, N. D.
 W. A. Carlen, Havana, N. D.
 Halvor Severson, Inwood, Iowa.
 Carl Otis, Lindstrom, Minn.
 A. M. Ferry, Cleveland, O.
 Geo. M. Crume, Cando, N. D.
 John Sandquist, Stillwater, Minn.
 F. D. Gould, Fairmont, Minn.
 Robertson Cook, Milwaukee.
 Fred C. Koehne, Sleepy Eye, Minn.
 John Larson, Mankato, Minn.
 A. W. Rydeen, Marshall, Minn.
 M. M. English, Marshall, Minn.
 J. C. Carpenter, Watertown, S. D.
 D. W. Bradley, Watertown, S. D.
 R. L. Eddy, Watertown, S. D.
 R. D. Turpen, St. Paul.
 Anton Evenstad, Lakota, N. D.
 O. B. E. Kinan, Roseau, Minn.
 T. A. Mair, Brookings, S. D.
 F. F. Lincoln, New York.
 Wm. Rabfuss, La Crosse, Wis.
 M. P. Mortonson, Cokato, Minn.
 Nils Erickson, Minneapolis.
 E. A. Dow, Minneapolis.
 N. P. Peterson, Owatonna, Minn.
 Eric Bjorkman, Dawson, Minn.
 W. A. Boyd, St. Paul.
 H. G. Kroning, St. Charles, Minn.
 W. E. Fox, New Hampton, Iowa.
 T. M. Thompson, Glenwood, Minn.
 D. L. Bell, St. Paul.
 Geo. C. Currie, Bois-Sevain, Minn.
 Robert Heilman, Marshall, Minn.
 M. G. Rogers, Newton, Iowa.
 John Wunder, Minneapolis.
 W. B. Watschke, Minneapolis.
 S. O. Mason, Redwood Falls, Minn.
 D. W. Radichel, Lake Crystal, Minn.
 Geo. Gabler, Mason City, Iowa.
 E. E. Durkee, Cloquet, Minn.

SEEN AT ST. PAUL.

The Universal Portland Cement Co., of Chicago had an attractive booth. A. E. Robinson, of the sales department, was in charge of the exhibit. The Guarantee Cement and Stone Co., the Northwestern sales agents for Universal, with office at 221 South Fifth Street, Minneapolis, combined with them and some of their representatives were present.

G. E. Ingersoll, the Northwestern agent of the Contractors Supply and Equipment Co., of Chi-

cago, had charge of their exhibit, which consisted of one of their well known Smith concrete mixers.

The United Cement Machinery Manufacturing Co., of Columbus, Ohio, had an interesting display of their various makes of concrete machinery. This was practically the same exhibit which this company had at the Chicago convention. There was always a crowd around this exhibit which was one of the most attractive in the entire hall. J. L. Shannon and H. L. Green were in charge of the exhibit.

The South Bend Machine Manufacturing Co., of South Bend, Ind., had a display consisting of their well known Standard cement brick machine, their Standard concrete mixer and their Standard gas engine. C. H. Lewis had charge of the exhibit assisted by Earl Winnie. There was always a crowd around the exhibit. Mr. Lewis expressed himself as well pleased with the convention.

The Cement Tile Machinery Co., of Waterloo, Iowa, had one of the most interesting displays on the floor. There are many money making possibilities in the cement working industry, but none presents a greater field of endeavor for progressive men than the manufacture of cement tile. Cement drain tile have proven superior to any others. They are porous, strong and durable, and absorb the moisture better than any other material. It is claimed that 3,000 tile can be made in a ten-hour day on one of these machines. The machine works with clock-like precision and held the interest of the visitors. They can make drain tile on this machine in seven sizes, 4, 5, 6, 7, 8, 10 and 12 inches in diameter—12½ inches in length, making just sixteen to the rod. One of the features of the machine is that one size can be produced just as fast as another. The machine also has molds for making small hollow building blocks. The display was not only one of the most interesting, but one of the most unique in the hall. Mr. Schenk, the inventor of the machine, and W. H. Stewart were on hand in behalf of the Cement Tile Machinery Co.

The Chicago Portland Cement Co. had an exhibit in charge of E. C. Schmidt. Their fine Havana cigars were much appreciated by the delegates.

Fairbanks, Morse & Co., had one of their cement testing machines on exhibition and it attracted considerable attention.

Nels Erickson represented the Medium Hollow Block Machine Co., of Minneapolis. He had several machines in operation showing the method employed in making cement blocks.

The Atlas Portland Cement Co., as usual had a decidedly attractive display. They gave away some handsome souvenirs, which were much prized by the visitors. Their catalogue and booklets were also in demand as they contain much practical information for the concrete operator. F. N. Clayton, of Chicago, F. E. Bayley, of Milwaukee, and Frederic E. Potter, the general sales manager from New York, were in attendance.

Martin T. Roche, secretary of the Northwestern Cement Products Association, is also the Northwestern sales manager for the Alpena-Portland Cement Co., of Alpena, Mich. They gave away handsome paper weights and aprons for cement users besides some interesting literature on cement. Their exhibit was popular.

The Pettyjohn Co., of Terre Haute, Ind., had several of their machines on hand. Their slogan, "We move the machines and not the blocks" was demonstrated in an effective manner. L. P. Dunn and Wm. Dunson were in charge of the exhibit and expressed themselves as highly pleased with the exhibition and wrote many orders.

The Marquette Cement Manufacturing Co. had a display in charge of R. B. Dickinson and J. A. Dunlap. They gave away cigars, pencils and pocket mirrors besides some interesting reading matter about their well known brand of cement.

L. O. Beaudet had a small model of his concrete elevator on exhibition which attracted no end of favorable comment. Mr. Beaudet lives at Mendota, Minn. He has already placed several of his elevators in Minneapolis, where they are giving satisfaction. The device is protected by patents. Mr. Beaudet has a good thing and knows it.

Handsome silver loving cups suitably engraved were presented as follows:

1—Best Display Booth—Expanded metal and Corrugated Bar Co., St. Louis, Mo.

2—Best General Display of Cement Equipment Machinery—Miracle Pressed Stone Co., Minneapolis, Minn.

3—Most Attractive Cement Brick—Peerless Brick Machine Co., Minneapolis, Minn.

4—The Most Unique Concrete Product Exhibit—The Blow Collapsible Steel Centering Co., Pittsburgh, Pa.

5—Best Display of Cement Block Work—National Stone Co., Minneapolis, Minn.

The Sandusky Portland Cement Co., of Sandusky, Ohio, had a display of their Medusa Waterproof Compound in charge of R. R. Fish and F. J. Morae. Both were pleased with the results of the show and made quite a number of sales.

The Flour City Concrete Block and Machine Co., Minneapolis, were much in evidence at the convention. They had several of their machines in actual operation and made quite a number of sales. Mr. Steele and E. P. Elliott were in charge of the exhibit. This machine has several unique features not possessed by any other on the market to-day and has met with wonderful success. Blocks made on this machine have a continuous air space and are tied together with a wood binder perfectly dry and treated with a preparation of their own, which is said to make it fire and water proof.

The Stevens Cast Stone Co., of Chicago, had an exhibit of their manufactured product in charge of Mr. Stevens.

The Expanded Metal and Corrugated Bar Co., of St. Louis, Mo., had an exhibit which attracted considerable attention. It consisted of a series of photographs illuminated showing various bridges and buildings either in course of construction or completed in which their materials were used. They also had several kinds of corrugated steel bars on exhibition and presented the visitors with a small sample bar. W. C. Berry had charge of the exhibit and explained to the callers the merits of their product. After leaving St. Paul Mr. Berry went to the Ames Convention.

The Northwestern Lime Co., of St. Paul, wholesalers of building material, had a display in connection with the Atlas Portland Cement Co. F. M. Williams, secretary of the company, and R. D. Turpen were in charge of the exhibit.

The Wisconsin Portland Cement Co., had one of the most attractive booths in the hall in charge of F. H. Merrell, the secretary, David Strech, E. J. Sigwalt and Geo. Barrowman. This company was organized January 12, 1905, and is incorporated under the laws of Wisconsin for \$750,000.00. They expect to commence building the plant in the spring and will have some cement to offer by next fall. The plant will be located near Portage, Wis.

The Winner Block Machine Co., of Minneapolis, had a display of their machine in charge of John Miller. Their machine makes a hollow brick which is an innovation in cement bricks. They also make a block machine. Both were shown in operation. Mr. Miller was much pleased with the convention and made several sales.

The Besser Manufacturing Co., of Alpena, Mich., had a display of block machines, sewer tile machines and drain tile machines. W. R. McPhee, their St. Paul representative, demonstrated their machines. Eureka Concrete Machinery has become well known to the concrete operators in all parts of the country. Mr. McPhee said he was glad he had come to the exhibit, and that they had come out first rate.

J. N. Campbell represented the International Fence and Fireproofing Co., of Columbus, Ohio. He was kept busy explaining the merits of their machines to the many visitors. Their display was one of the most interesting in the entire hall and many thought it should have had a prize.

The Felt and Tarrant Manufacturing Co., of Chicago, had a display of Comptometers in charge of W. B. Matschke, of Minneapolis. These machines are almost human. Two very pretty girls operated the machines and it was difficult to determine which made the bigger hit, the machines

or the girls. The machine adds, subtracts and multiplies.

As usual the Peerless Brick Machine Co., had a most elaborate display. L. V. Thayer, the president, was present with several assistants and demonstrated the rapidity with which cement bricks can be made on their machine. The Peerless Brick Machine Co., was awarded a silver loving cup for the best display of cement brick. Mr. Thayer in speaking of the convention said he believed it to be the consensus of opinion among the exhibitors that the convention was the most successful yet held from every standpoint. He said that he had sold several machines and was entirely satisfied with the results. At present this company has so many orders on hand that they are unable to sell any machines except for future delivery.

Lee Stover, the new president of the association was born in Watertown, S. D. He was educated for the bar and practiced for some time. Ten years ago he became interested in concrete construction and entered the business. He is now one of the largest operators in South Dakota. It is predicted that he will make an excellent presiding officer and the general verdict is that the association made a wise choice when they selected him to guide their destinies.

Secretary Martin T. Roche, who was re-elected by acclamation, was one of the most popular men at the convention. Although at all times fairly up to his ears with work he found time to be pleasant and courteous to all with whom he came in contact. He is possessed of wonderful executive ability and accomplishes a world of work with little apparent effort. Mr. Roche was born in Detroit and educated at Detroit College. His first position was with the Michigan car shops. Later he became connected with the Chicago World's Fair and distinguished himself. Seven years ago he associated himself with the Alpena Portland Cement Co. and is now their Northwestern sales manager.

A committee consisting of C. W. Stevens, Harvey, Ill.; R. Bruce Colton, Jackson, Mich.; and W. E. Green, Waterloo, Iowa; presented H. A. Rogers, chairman of the Exhibit Committee with a purse, raised by subscription as a testimonial of the convention's appreciation of Mr. Rogers' services. Mr. Colton mounted a chair in the center of the convention hall and in a few well chosen words paid the trade press a high compliment. Mr. Rogers has done considerable work for trade newspapers and is at present connected in an official capacity with *The Improvement Bulletin*, of Minneapolis.

About 150 delegates sat down to a banquet at the Ryan Hotel Thursday night. This proved one of the most enjoyable features of the convention and enabled the members to become better acquainted with one another and as one of the speakers put it, "cement friendships." An interesting musical program was rendered, and the talks, most of which were impromptu and interpolated with humorous anecdotes, served to bring about that good feeling so essential to the ultimate success of any association meeting or convention.

The Miracle Pressed Stone Co. had one of the most attractive and complete exhibits in the hall. They chartered two cars Wednesday morning and took a crowd of delegates over to their plant.

The Municipal Engineering and Contracting Co., of Chicago, had one of the largest and best exhibits at the convention. They had one of their well known cube mixers on exhibition in actual operation.

The Matthews Gravity Carrier Co., of St. Paul, had one of their carriers on exhibition in the center of the hall. The device attracted considerable attention. There are many of these carriers in use and concrete operators consider them an indispensable adjunct to a well regulated concrete plant. They took many orders for them.

The Perfection Power Block Machine Co., whose home is in Minneapolis, had a booth and some of the products of their machine. Space would not permit them showing a machine in actual operation. The Perfection machine gives a 100-ton pressure to every block and makes between 600 and 1,000 blocks a day. There are many of these machines in active use over the country and they have invariably given satisfaction. E. A. Dow was in charge of the exhibit.

J. C. Freeman, general manager of the Northwestern Clay Manufacturing Co., of New Windsor, Ill., was in attendance at the convention. The Northwestern is one of the many branches of the American Sewer Pipe Co., of Pittsburg. Mr. Freeman said that his concern had a remarkably busy year.

Edward Bogk, president of the Ricketson Mineral Paint Works, of Milwaukee, was an interested visitor at the convention. Incidentally he paid Rock Products a high compliment, as he said that it was one of the few papers they were perfectly satisfied with.

Probably one of the most interesting as well as elaborate exhibits to be seen was that of the Blaw Collapsible Steel Centering Co., of Pittsburg, Pa. The attracting feature about the exhibit was that Jacob B. Blaw, the patentee, was in charge and demonstrated his system of sewer building by actually building a section in the presence of the visitors. The work was done by an inexperienced workman who did the job in two hours.

John Carlon, of Havana, N. D., had a brick machine on exhibition which varies somewhat from others, as the brick is hollow, therefore saving half the material. His machine attracted a great deal of attention and will no doubt be heard from in the future.

R. Z. Snell, of South Bend, Ind., was on hand with his batch mixer which always demonstrates itself to be one of the best on the market and worthy of the attention of all interested in concrete mixers. Mr. Snell's exhibit consisted of a hand mixer and a power machine driven by one of the famous air cooled gasoline engines.

R. J. Alldeman represented the Gardner Hardware Company, of Minneapolis, Minn., who had a nice exhibit of cement user's tools.

The No-Damp Two-Piece Concrete Building Block System, of Minneapolis, Minn., had a fine exhibit and showed a machine that makes a block that is practical and reasonable. The exhibit was complete and was in charge of F. W. Tibbal and W. E. Brewster.

The Anchor Concrete Stone Co., of Rock Rapids, Iowa, were represented by C. W. Bradley, and M. C. Dahl. They also make a continuous air space and a two-piece wall block.

The National Stone Manufacturing Company deserved first honors in showing the best display of cement block work and were awarded the prize by a unanimous vote. The blocks were of the class A Style and were formed into an entrance showing a piece of the side wall, railings and columns. C. A. P. Turner is president of this company.

P. C. Jennings, was in charge of the booth of the Ballou Manufacturing Co., of Belding, Mich. Their Little Giant Mixer was shown to the conventionites, who seemed to think it was one of the mixers on the market to stay.

The Minnesota Manufacturers' Association, of Minneapolis, Minn., had one of their gravity freight carriers on exhibition in charge of C. H. Lister.

The Fischer Hydraulic Stone Machine Co., of Baltimore, Md., were represented by Charles A. Massey and Daniel A. Leonard. They showed some of their product and gave away a very complete catalogue.

One of the most unique labor saving devices on the market in the way of cement tools is the adjustable cement trowel manufactured by P. F. Connelly, of Sioux Falls, S. D. A small section of a cement walk was finished every few moments showing how easy a finish could be obtained while the operator was in a standing position. It does the work rapidly and in first class style.

R. Bruce Colton was on hand with his usual smile and his famous hand mixer. Mr. Colton enjoys the distinction of being one of the oldest men in the concrete block business.

One of the most up-to-date concrete contractors who attended the convention was Geo. A. Rayner, of Rice Lake, Wisconsin. Mr. Rayner makes everything that is practicable with concrete.

O. H. Olsen with offices in the Lumber Exchange Building, Minneapolis, Minn., thinks the concrete business is only in its infancy. He says

he can see great improvements in the concrete machinery over last year.

J. V. Godfrey, Moorehead, Minn., was present absorbing all the information possible, as he says his people are anxious to do the best concrete work.

The Iowa Enamel Brick and Stone Co., of Des Moines, Iowa, had a booth, which attracted a great deal of attention by their new process.

John F. Fischer, one of the leading architects of St. Paul, spent an afternoon looking over the exhibit feature. He is much interested in the progress of the industry.

W. Radichel, of the North Star Concrete Co., of Lake Crystal, Minn., said that they had had a busy season and that the outlook was good for next season.

C. H. Benson, a contractor and builder of Minneapolis, attended the convention. He is seriously considering the concrete proposition and expressed himself as highly pleased with what he saw.

A. C. Monson, representing the Farmers Lumber Co., of Emonson, Minn., who attended the lumbermen's convention at Minneapolis, came over to the convention and became much interested in the exhibits. He may enter the business, he says.

J. S. Robbins, who is a lumberman at Willenor, Minn., also handles cement, lime and plaster and took quite an interest in the exhibits. He attended the lumberman's convention at Minneapolis.

Wm. Gerson, representing Fowler & Pay, the well known builders' supply men, of Mankato, Minn., called at Rock Products' headquarters and said he was glad he came to the convention as he saw much to interest him.

Mr. Ewing, who about a year ago purchased the business of the Como Stone Co., of St. Paul, said that his business has increased at such a rapid rate that he will go into it on a larger scale in the spring.

One of the prominent Canadians who visited the convention was George C. Currie, of Boissevain, Manitoba, Canada. He has a Palmer block machine and has been in the concrete business for the past three years.

T. R. McCormic, of Sandstone, Minn., was much pleased with the convention. He is at present operating with an International Block Machine and does considerable side walk construction. He has had a prosperous year.

Bliss Stebbins, representing the Lansing Wheelbarrow Co., of Lansing, Mich., took in the convention and spent some time looking over the exhibits.

Ole S. Quammen, of Quammen Bros., lumber dealers and concrete operators of Britton, S. D., was one of those who braved the snow blizzard to attend the convention and was not sorry that he did.

J. W. McKay, of Jayville, S. D., was on hand. He has been successful during the past season with his concrete business which he says is on the increase.

Theo Schumm, of Arlington, Minn., was in attendance at the convention. He says they already have in operation a Medium block machine, an Excelsior brick machine and an International Tile Machine. The past season was good and he has no complaint to make.

F. G. Corsen, who is a well known architect in Minneapolis, was an interested visitor to the convention. He expressed himself as highly pleased with what he saw and marveled at the wonderful strides the concrete interest had made in the past few years.

Paul A. Low, a contractor and builder of Minneapolis, says that he has been doing some concrete work and contemplates purchasing a machine.

Mr. William Cameron had charge of the erection of the booths and the fact that the exhibitors were enabled to get their displays in shape in short order was largely due to his efficient direction of the affairs of the floor. He is a prominent St. Paul contractor and an assemblyman for the city.

He recently achieved distinction as a concrete operator by erecting the new Orpheum Theater in St. Paul in record breaking time. The theater is a model of its kind and absolutely fireproof. It is one of the handsomest theaters in the city.





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IF you had a **valid basic patent** controlling the cement industry and had spent **tens of thousands** of dollars and **five years** of strenuous effort to bring a suit under it to a final hearing before the Circuit Court of the U. S. and had argued the case pro and con for **five days** before an able Judge of that Court, and had waited nearly **three months** while that Court was preparing and was about to announce to the world its opinion of the scope and validity of that patent, **WOULD YOU**, if you believed you were about to receive a sweeping vindication and an indisputable right to peremptory preliminary injunction against every coal-burning cement manufacturer in the United States— we say, **WOULD YOU** precipitately **withdraw** your suit and telegraph the Judge to withhold his decision and to **dismiss** the suit?

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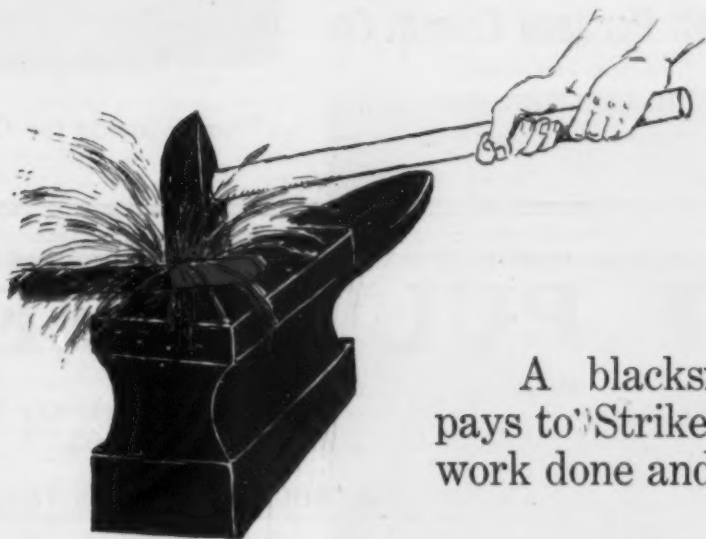
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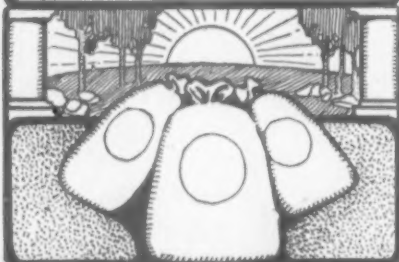
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CEMENTOLOGY

Circulation 10,000

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of
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and
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Published by
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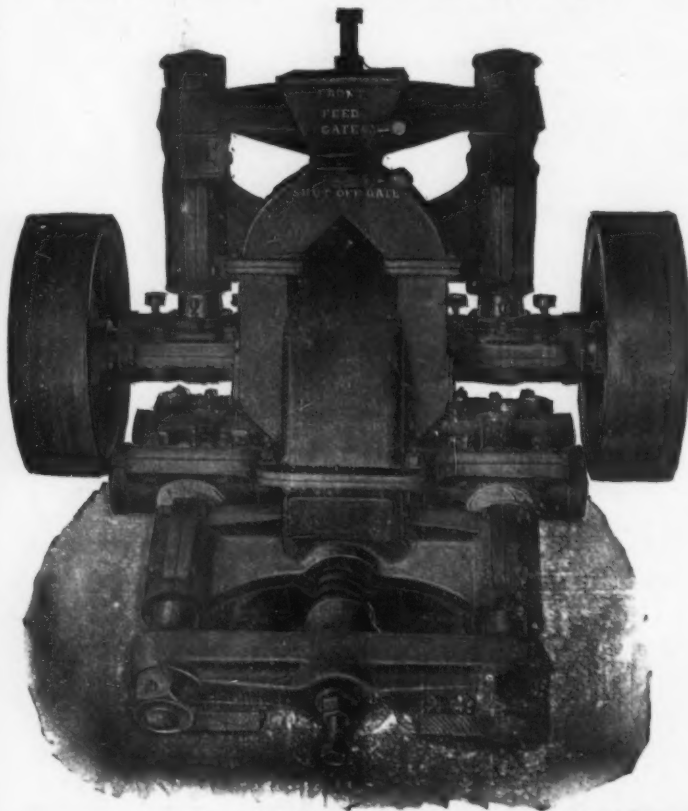
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CEMENT CLINKER,	12 "	" "	100 "
LIMESTONE,	2½ tons	" "	200 "
LIME,	4 "	" "	100 "
ROSENDALE CEMENT,	43 bbls.	" 90%	50 "
QUARTZ TRAP-ROCK,	4 tons	" "	40 "

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Tell 'em you saw it in ROCK PRODUCTS.

Concrete Failures.

Excerpts From a Paper Read Before the Northwestern Cement Users' Association by John T. Flather, Professor of Mechanical Engineering in the University of Minnesota.

So many and so serious have been the failures in reinforced concrete work, that the general public is beginning to think that something must be wrong with this system of construction. Even engineers and architects of good standing have pronounced it dangerous and are afraid to use it.

* * *

The frequency and magnitude of these failures and the resulting loss of life and property have thrust upon us the unwelcome fact that something is wrong, but surely no one who understands the properties of concrete and steel would hesitate to use them under proper conditions, either in columns, beams or floors. The use of concrete, both plain and reinforced, has been so extensively and satisfactorily adapted to all kinds of construction that it must be conceded to be one of the best of all the known building materials. Its perfect adaptability to form; its convenience in handling; its fire proof qualities; its increasing strength, and all the other advantages which it possesses and with which you are familiar, render it universally applicable to building operations, hence its use should not be restricted to any particular construction—rather should its use be extended. Foundations, columns, beams, floors, walls, and roofs when made of reinforced steel concrete properly designed and constructed have a degree of permanency and strength which increases with time and, like good wine, improves with age.

But in order to obtain these results the properties and characteristics of the material must be recognized. Not only must we employ the best ability in designing every detail of such construction, but intelligent labor and competent supervision must be employed in its execution.

It is not sufficient to specify the various proportions of the concrete or the tensile strength of the steel; these may be excellently stated in the most approved grammatical form, and yet the structure may fail because the rods used in a beam were not carried over to a bearing. You can't stick a concrete beam onto the face of a wall; neither can you make good concrete out of shavings and horse manure. A careful study of failures which have occurred during the past year indicates that it is not reinforced concrete that is at fault: it is the men behind the concrete. Engineers architects and contractors who have attempted its design with improper knowledge of its properties; inexperienced contractors who have attempted its use without appreciating the necessary requirements; cheap, ignorant and careless labor without competent supervision; and not the least common factor, is the man who tries to skin the job knowing full well that if his work will hold up long enough to stand the prescribed test he will get his money and the work will improve as time goes on.

These are the principal direct causes of failure in reinforced concrete construction. Every one who has had anything to do with reinforced concrete during the past few years can point to some failure due to one or more of these causes, and he is fortunate indeed if only a minor accident follows, or if the cause is recognized and the defect remedied before trouble ensues.

A detailed consideration of the various failures of the year would be most interesting and valuable, but time does not permit. One of the most common of the earlier causes of failure, and one which is yet all too frequently met with, was the use of inadequate framework, or its premature removal before the concrete had set sufficiently.

* * *

Numberless failures are constantly occurring, due to faulty design or poor execution or both, which do not gain publicity because of their minor character and freedom from loss of life; yet these failures may be serious indeed for the owner. A sinking floor may fail to give such early indications of weakness as to call for a modification in design with additional reinforcement, or stiffer beams and stronger columns or more of them. Possibly it may require all of these, and even then the walls may be cracked or the floor so deflected that only a fraction of the desired load may be carried.

In these cases the owner frequently has no redress, but as long as owners continue to give their work to the lowest bidder simply because he is the

with reinforced concrete which demands the greatest care and faithful supervision in all its details, from the mixing of the concrete to the removal of the forms. The apparent simplicity of this construction has attracted large numbers into the field, and we shall expect for some time to come that serious mistakes will occur even with the best intentioned and most careful of men. Many of those who have entered the field however, have no proper conception of the limitations imposed and rush into the work with a confidence which is sure to bring trouble; here lies the principal dangerous feature of reinforced concrete construction.

* * *

In considering the various failures of reinforced concrete, it will be readily seen that there is always a cause which is usually quite apparent. I do not believe there is any uncertainty about concrete construction, or that concrete buildings are dangerous. When such structures are properly planned by skilled designers, and erected by honest and experienced contractors who employ intelligent men and use good material, there is no uncertainty about the combination, and the safest of all structures.

Concrete Chimney Falls.

On the night of January 19, the concrete steel chimney at the new Seelbach Hotel, Louisville, Ky., collapsed in the midst of a gale which registered by the United States Weather Bureau 42 miles an hour. The chimney was built in the summer of 1904, by the Weber Steel Concrete Co., of Chicago. It was 176 ft. 7 in. high, with an inside diameter of 4 ft. 6 in. The chimney was reinforced according to the Weber system with 18,000 pounds of T-shaped steel bars, the vertical bars being considerably heavier than the bars bent into horizontal rings for the lateral reinforcing. The Weber company guaranteed the chimney to withstand a wind pressure of 100 miles an hour, figuring upon a factor of safety of 4.

The conditions under which the chimney fell were unusual. The hotel company for several months has been engaged in the erection of an annex and the excavations have been dangerously close to the footings of the big chimney. The entire composition of the earth at this point is almost entirely sand and gravel, so that undoubtedly the large excavation so near at hand, had some effect upon the footing. Appreciating this fact, the shaft of the chimney at the time of its destruction was scaffolded up to within 25 or 30 feet of the top with a net work of trusses and loose boards. This was being done for the purpose of placing a collar near the top of the chimney for attaching guy lines, in order to keep it secure. Consequently, when the gale came, the chimney was really being used as a mast for the scaffolding and their boards represented several times the exposure to the wind that were carried in the calculations at the time the chimney was built.

It is said that the first intimation that the chimney was insecure came from the Weather Observatory in the Custom House about half a block away. The observer having a fine view of the chimney noticed by chance that it swayed out of plumb with little or no provocation something like 9 inches. The chimney broke off about 70 feet from the top, being that part of the shaft that was loaded with scaffolding. Expert engineers examined the debris and it was found that at the point of fracture, there was no adhesion of concrete to the steel re-inforcing of any noticeable strength at least, for the steel came away from the concrete clean and sharp, and it looks as if the section, where the fracture occurred, was poor concrete work from the first. The Weber company has agreed to replace the chimney without cost in this way making good upon the original guarantee.



MARTIN T. ROCHE, SECRETARY NORTHWESTERN CEMENT PRODUCTS' ASSOCIATION.

lowest bidder without any other claim to consideration, just so long will these conditions exist.

A large amount of this work is put in on the contractor's own designs and the man who does the cheapest work gets the job. Whether he is a competent man experienced in this work or not seems to make little difference. In such cases the owner deceives himself for there is in reality no competition under these conditions; in order to have competition all proposals must be based upon the same construction, which obviously is not the case where every one bids upon his own design. Competition in this class of work is not always desirable, but if it be desired or necessary, the safest method to secure this and also to insure correct design and execution in reinforced concrete is to employ an experienced engineer to plan the work and supervise its construction, and even then poor results may follow if eternal vigilance is not exercised throughout the entire work.

Proper treatment of the concrete and a realization of the nature of the process of setting, is one of the requisites of success in structures of this character. No matter how well a building may be designed, a failure is always liable to occur unless the plans are closely and intelligently followed. This leaves an element of uncertainty in connection

Notes of Iowa Cement Users' Meeting.

The meeting of the Iowa Cement Users' Association, held at Ames, Iowa, on January 23, 24 and 25, was a pronounced success from every standpoint. There was a much larger attendance than that recorded at the first convention last year when the association was organized. The widespread interest in the cement industry and the manufacture of concrete commodities is growing at a rapid pace in the state of Iowa, and this Association has before them an enormous field of usefulness which they are using every endeavor to cover in a careful and intelligent manner.

John G. Evans, Chicago salesman, and F. C. Bailey, Iowa and Wisconsin salesmen, of the Atlas Portland Cement Co., were present with their winning smiles. They not only told the conventionites what they were selling but impressed it upon them in a material way by giving each and every one either a beautiful leather bound memorandum book, a real cigar, or one that wasn't real. They were also distributing a complete descriptive catalogue.

The Marquette Portland Cement Co., represented by R. B. Dickinson and A. A. Sheneberger, who endeavored to furnish every one present with either a pencil to write their orders with, a cigar to smoke, while they thought it over, or a 72-page catalogue to tell them about the virtues of their cement.

George H. Carlon, of Oskaloosa, Iowa, attracted a great deal of attention with his famous wall plug. Mr. Carlon has attended several conventions this year and every one seems to think that he has a wall plug that has more to it than advertising and pictures. The architects, engineers and contractors pronounce it a howling success.

Many conventionites asked the representative of Rock Products why everything moved along so smoothly and why they did not hear the usual complaints of the people in general about this, that and the other. The answer was that Prof. Ira A. Williams, secretary of the convention, had things in charge. He was untiring in his efforts to please, answered every question as though it were the first and made you think when he was doing anything for you that he would a little bit rather do that particular thing than anything else. Professor Williams could not have accomplished this without the able assistance of C. C. Clauson and a number of other lieutenants connected with the college. It has never been our privilege to attend a convention in a place of this kind where everybody tried to help the other fellow. The students seemed to think it was a pleasure and a privilege to wait upon the exhibitors and all of those who needed help. The space was free, tables were furnished and elegant accommodations were provided for those who did not care to stop in the city.

S. I. Zearfoss, of Ames, Iowa, contractor and cement sidewalk builder, pronounced the convention a howling success.

M. M. Stewart, the popular block man, of Armstrong, Iowa, was present to absorb all the information and other things that were loose. Mr. Stewart uses an Anchor machine made at Rock Rapids Iowa, and a Miracle brick machine.

W. L. Suter, of Sibley, Iowa, came down to find out the whys and hows of cement and its products and was not disappointed.

A. L. Alexander, representing the firm of Alexander and Frederickson, Jewell Junction, Iowa, was present to find out the good things that were doing in cementing.

L. S. Dobson, of Nora Springs, Iowa, an old subscriber, dropped into the Rock Products' booth

and said that while there was not as much machinery displayed as he expected, the meetings were satisfactory.

G. D. McNabb, of Emmetsburg, Iowa, one of the engineers of the Northwest who is an authority on drainage, came down to hear what other people had to say on the subject. He reported a very satisfactory interview with a number of the leading men present on this subject.

F. W. Staley, the man who builds steps and sidewalks at Audubon, Iowa, was present, and judging from the breadth of his smile he was satisfied with the convention.

F. E. Butler, of Jamaica, Iowa, reports a satisfactory year in the block business and says that the information he gathered will help him a great deal in his work this year.

Thomas Johnson, of Grundy Center, Iowa, thought the subjects discussed were fully covered and that a great many new things were brought to light. Mr. Johnson manufactures blocks on a Stewart machine made at Waterloo, Iowa.

R. C. Muller, of Gilman, Iowa, contractor and sidewalk builder, sees a great future for cement and its products. He says he has received a great deal of good from the convention and expects to come every year.

J. N. Muncey, of Jesup, Iowa, while not actually engaged in the cement business, is interested enough to pay his fare to Ames to attend the convention. If a man who is not actually engaged in the business would come this far to learn the good things at the convention, why do so many who earn their daily bread through this medium stay at home? This no doubt is the answer to the question, "Why is it so many block men fail?"

A. A. Smith, of Jamaica, Iowa, came down to hear what the learned ones had to say.

Burt Eaton, of Audubon, Iowa, representing the John Wighton Co., came down to absorb some of the good things being passed around in the convention hall, as well as those in the exhibit corridor.

Milo H. Cook, Griswold, Iowa, who builds sidewalks that don't crack, came down to tell the others about it.

J. A. Stark, Pilot Mound, Iowa, says the convention was a howling success from every standpoint. He also says that he could not keep house without Rock Products.

E. O. Donnell, Fonda, Iowa, says he received a great deal of information and that several good points were enlarged upon in the meetings. Mr. Donnell is engaged in the block and tile business and reports a satisfactory year.

W. H. Quinn, Rock Valley, Iowa, representing the contracting firm of Quinn & Hogan, says the prospects are bright for spring trade, and that the convention from a contractors' standpoint, was a success.

F. E. Clark, of Ames, Iowa, manufacturer of cement blocks, doesn't wish the other towns of Iowa any bad luck but he hopes Ames will get the convention next year.

N. Tjernagel, of Story City, Iowa, says: "I am just a farmer but I expect to use a lot of cement this summer and thought I would come over and find out something about it, and I have not been disappointed."

William A. Lawrenson, secretary of the Jewett Lumber Co., Des Moines, Iowa, dropped in for a day to get acquainted and say hello to his many friends. He reported the convention a grand success from the dealer's standpoint.

C. R. Allen, city engineer of Ottumwa, Iowa, was present and attended every meeting. He says a great many thoughts are brought out in the meetings and that he would go back home feeling fully repaid for the time and money spent on the trip.

D. P. Faus, of Waterloo, Iowa, member of the firm of Faus & Ryan, contractors, who has been a subscriber to Rock Products for a number of years, seemed well satisfied with the convention and the world in general. Mr. Faus says the prospects along the contracting line look bright in Waterloo and that the people of his city are becoming educated and beginning to realize the value and merits of cement and its uses.

A. H. McGregor, of Berkeley, Iowa, who manufactures tile, said that the convention was the best ever, that he was more than pleased with the prospects for cement tile in his locality, and that the people were beginning to understand the uses of cement.

E. E. Gilton, the popular contractor of Rhodes, Iowa, was present to learn, look and listen, and incidentally give the other fellow a little information.

Albert Anderson, St. James, Minn., says he was disappointed in not finding more machinery exhibited, but otherwise the convention was fine.

H. E. Rounds, Rock Valley, Iowa, says the contractors in Iowa make a great mistake by not attending these conventions, as he has learned a great deal and hopes that it may be his privilege to attend a great many conventions.

H. F. Reed, Ankeny, Iowa, reports everything lovely in the contracting business in his city and says the citizens are taking hold of cement and using it for a great many purposes.

C. L. Waltmire, of Ames, came out to see what his visiting brothers had to say, what they were doing and how they were going to do it. He says he can see no reason why they should hold the convention in any other place as Ames has some natural advantages which could not be found elsewhere.

Senator J. P. Dolliver paid Rock Products a visit and said that he was more than interested in cement and its products. We do not know whether the Senator had taken too freely of the water proofing across the way, or whether he had absorbed too much cementum, but the strange part of it was that he tried to bite the end off of one of those famous Atlas wooden cigars. He took the joke in good fun and said he would get even by taking it back to Washington with him.

J. B. Hungerford accompanied the Senator and seemed to enjoy the joke very much. Mr. Hungerford reported the convention a grand success from an outsider's standpoint, as everyone was ready with information and a smile.

R. H. Sutherland, Gilman, Iowa, manufacturer of blocks, said he had attended several conventions during the past years and he could see great improvement, both in the class of people attending them and the way subjects were handled in the convention hall.

E. M. Ross, Ross, Iowa, county supervisor of Audubon County, was here in the interest of his people, to absorb as much knowledge and information possible in regard to bridge and culvert building. Mr. Ross says that they contemplate using a great deal of cement for county work this year and that he is more than pleased with the results of his trip.

C. R. Brown, Marshalltown, Iowa, a member of the Brown Fuel and Lime Co., says he always attends the Iowa convention because they always have some good things for him and that the meetings are of great benefit to those who are interested in cement.

F. Robertson, of Marshalltown, Iowa, who is a contractor, says the people of Marshalltown are just waking up to the fact that cement is a good thing and that other things than sidewalks can be made from it with success.

Ed Clift, of Sutherland, Iowa, a sidewalk contractor, says the papers read in Thursday's meet-

ing were interesting and that a great many valuable points were brought out. He expects to come again next year.

B. H. Heckert, Sutherland, Iowa, came down to learn about the good things and to find out what was doing.

Y. D. Campbell, of Cherokee, Iowa, contractor and general cement worker, has some ideas of his own in regard to sidewalk building, which should be considered. He says, "The convention is all right and I look forward to them."

Engineer John M. Wells, of Nevada, Iowa, says they are doing a great deal of concrete work in his locality but some of the contractors are making a mistake by using dry mix.

Thomas French, of Coggon, Iowa, one of the leading contractors of that city, said the convention was a success from a contractor's standpoint. He came to hear the discussions and what the other contractors had to say.

George Sotol, Sibley, Iowa, member of the Sibley Cement Walk, Block and Tile Co., reports the contracting business as being good in their locality.

Phillip French, Byar, Iowa, contractor and cement and sidewalk builder of that city, said he expected to see more machinery on exhibition, but otherwise the convention was a howling success.

H. B. Chapin, Union, Iowa, came down to absorb all the information possible, and was not disappointed.

D. E. Donovan, Jefferson, Ia., who builds steps and sidewalks, said the contractors of the State should visit these conventions and take part in them, as each and every one seemed to have a different idea about building sidewalks.

F. B. Parsons, Clemin, Iowa, who uses the Lake City post machine, for the manufacture of fence posts, said he was disappointed in not finding some machinery in his line exhibited, but that the papers that were read were better than he expected at such a small convention.

E. A. Tesdall, Huxley, Iowa, subscribed for Rock Products and incidentally expressed his views on the convention. Mr. Tesdall said that conventions were a great thing and that every man interested should attend them and if possible, take some active part.

J. A. McLay, representing the Colo Cement Block and Tile Co., of Colo, Iowa, said the block building industry was growing in their locality and that the prospects for spring were bright.

M. W. Templeton, who lives near Ames, Iowa, was much surprised to see a large delegation of men in attendance. While he is not directly interested in the cement business, he is contemplating building several buildings and naturally wants to find out how it should be done, and the convention hall is the place where these things are brought out.

George Wiswell, of New Sharon, Iowa, said the convention was much better than last year and that he was sure every cement user in the State would be a member if he knew the advantages of the association.

T. J. Jacobson, Roland, Iowa, contractor and general builder, said that cement was making rapid strides in his city and that people were just beginning to understand and appreciate the advantages of cement.

J. O. Burlington, Pocahontas, Iowa, who uses the Miracle block machine, said he was much interested in the papers read on water-proofing and the mixing of cement with different substances.

W. H. Derry, Lamoni, Iowa, member of the firm of George Derry & Sons, who manufacture blocks and use a Stewart machine made in Waterloo, Iowa, said that people were just beginning to appreciate the cement block in their locality.

L. L. Tippey, Waterloo, Iowa, general cement sidewalk contractor, said he was more than pleased with his trip and with the way things were handled at the convention. He said he would come again next year.

John McIntire, Belle Plaine, Iowa, attended every meeting and seemed much interested in the general proceeding.

L. Christensen, Sioux City, Iowa, came down to see what was doing and to gather in all the good things in sight. He said the convention was a success and hoped he could arrange his work so he could come again next year.

McCutchen & Shoben, of New Sharon, Iowa, say they could not keep house without Rock Products and that the papers read at the convention were complete.

William J. Schofield, Ames, Iowa, paid Rock Products a visit and said that the convention was interesting to an outsider, owing to the fact that it touched a subject that was only in its infancy.

J. H. Welp, Bancroft, Iowa, a member of the Northwestern Draining and Construction Co., said that they expected to do things this year.

A. O. Anderson, Lake City, Iowa, said he had enjoyed the convention and that he could see a steady increase in the use of cement for different purposes in all parts of the State.

George A. Jewett, member of the firm of Jewett Lumber Co., of Des Moines, dropped in to see what the conventionites were doing and incidentally shake hands with his many patrons who are scattered throughout the State.

L. A. Leopohl, Knoxville, Iowa, member of the county board of supervisors of Marion County, came up to gain all the knowledge possible in regard to the construction of culverts and bridges made out of reinforced concrete. He said he was more than pleased with the papers that were read on these subjects and the general information he gained from men who are directly interested along these lines and who make it their business.

S. C. Johnson, Knoxville, Iowa, the popular lumberman and dealer in cement, lime, etc., said these conventions are a good thing and should be attended by every lumberman and cement user in the State.

E. E. Girton, Rhodes, Iowa, reports everything flourishing in his little city and that he received a great deal of good from the convention.

Alex Ruthven, of Ruthven, Iowa, contractor and general cement user, would like to know why so many people vitally interested should turn a deaf ear to the call of the secretary of the association.

L. H. Bauck, Emmetsburg, Iowa, subscribed for Rock Products and said he realized what conventions and trade journals meant to the cement users. Here's hoping that others will wake up and get out of that old rut, then we will not hear so many complaints and concrete work in general will not be condemned so often.

B. Brewer, of Dysart, Iowa, joined the association and said he was much pleased with the way the convention was handled and the general information that he gained while there.

R. E. Lynn, Grundy Center, Iowa, who makes blocks, tiles, sidewalks, etc., is optimistic in regard to the cement contracting business for 1907 and said the convention was much better than he had anticipated and that he would surely come again next year.

B. F. Nickerson, Ames, Iowa, general contractor, said he hoped the convention would be held at Ames every year and that the other contractors over the State would take hold of this matter in a more material way, for they certainly would get their money's worth if the membership fee were ten dollars instead of one.

George Henningsen, of the Remballton Concrete Bridge and Culvert Co., Kimballton, Iowa, was on hand with several good ideas to exchange for others.

R. E. Walker, member of the Sabula Pressed Stone Works, Sabula, Iowa, said he was only just beginning to learn how to handle cement and that the convention was one of the best mediums by which to find out the whys and hows of concrete.

Frank Perkins, member of the well known builders and supply concern known as Perkins & Perkins, came up Thursday to shake hands with their many customers over the State and find out what was doing in general.

Samuel P. Ward, the up-to-date contractor and mason of Belle Plaine, Iowa, said the contractors over the State are just beginning to wake up, and that he has been setting grates, mantels, etc.,

making cisterns and vaults, and doing general contracting for some time. The contractor who does not know his business and will not try to learn will never succeed, but will remain in the ordinary class.

W. A. Barnes, who builds cement sidewalks, curbs, posts, etc., at Storm Lake, Iowa, said he could not understand why so many contractors would stay away from the convention when they might gain some information which would mean hundreds of dollars to them the coming year.

C. Vestesen, of West Burlington, Iowa, attended every meeting of the convention, and said the papers read were interesting as well as the discussions, which were so fully covered by the many members of the association. If more members of the association would express their views upon the different subjects under discussion, it would help them as well as the others present.

James Maine, the popular jobber of Des Moines, dropped in for a day and said he was surprised to see so many representative men in attendance, and that this only showed that cement was coming to the front, and that others besides the man out of a job were taking hold of this business.

George Kell, of the Sherburn Cement Drain Tile Co., Sherburn, Minn., who also makes all kinds of cement products, said, while he expected to see more machinery exhibited, especially block machines, the convention was a howling success from a contractor's standpoint, as the papers read brought out a great many new ideas.

L. S. Johnson, president of the Johnson Concrete Machine Co., of Sioux City, Iowa, who makes the machine known as the Warren, said he was much disappointed in not being able to get one of their machines on the ground, but that he was more than pleased with the prospects in their line for the coming year, and that the contractors and cement users in general were considering the different machines carefully.

George Schumacher, president of the Clarion Concrete Construction Co., Clarion, Ia., who uses cement by the carload and other things in proportion, dropped in to see how other people were doing things and if there was anything being done in a different way than he was doing it.

P. G. Coutts, ex-president of the association and mayor of Grinnell, Iowa, said this was the best convention ever, and that he felt sure they would grow from year to year until they reached the point where every cement user of any importance in the State of Iowa would be a member. A convention would be like a ship without a rudder if Brother Coutts is not present. Mr. Coutts is a man who knows his business and has a way of expressing himself that makes others understand.

The Cement Tile Machinery Co., who make the Schenk patent drain tile machine, were represented by President J. A. Stewart and M. J. Pfiffner. These gentlemen seem to be doing a land office business, and while they did not have one of their machines on the ground, they had some of the products made by it which seemed to excite a great deal of interest.

The Ballou Manufacturing Co., of Belding, Michigan, were represented by Frank Jennings. Mr. Jennings was unable to get one of his machines in operation until Friday morning. Being the only machine on the grounds in operation, it naturally created a great deal of attention. Most of the conventionites paid the booth a visit and pronounced it one of the best machines they had ever seen. Mr. Jennings said he was more than satisfied with the results of his efforts and would surely come again next year.

The Sandusky Portland Cement Co., Sandusky, Ohio, who make the famous Medusa water-proofing compound, were represented by R. R. Fish. Several of the engineers present, as well as some of the chemists, tried to corner him and show him where his water-proofing was N. G., but Mr. Fish was right there and answered every question satisfactorily and seemed to convince all those who paid his booth a visit that Medusa water-proofing was all that he claimed for it.

The Universal Portland Cement Co. was represented by E. A. Coates. Mr. Coates said the convention was not as large as he had expected, but the people in attendance were very enthusiastic and wanted to know all about the Universal.

The manufacturers of small draining got together and held a meeting and discussed the question of organizing for the purpose of protecting the tile men. A committee was appointed and reported. The following officers were elected: H. C. Schadtolt, of Emmetsburg, Iowa, president; L. L. Bingham, of Estherville, vice president; George F. Sokol, Sibley, Iowa, secretary; George F. Kell, Scherburn, Minn., treasurer. They appointed the first meeting to be held the last Tuesday in June at Emmetsburg, Iowa.

One of the features of the convention was the way in which A. N. Carstensen, better known as "Silver," attended to the many wants of the conventionites. "Silver" was ever ready to help those who needed it and to answer any questions. The representative of Rock Products in behalf of all those in attendance, wishes to thank Mr. Carstensen for his efforts.

The Bovee Grinder and Furnace Works, of Waterloo, Iowa, have one of the most practical systems for the construction of walls or buildings. It consists of a set of moulds which are used for the outside face and boards used for the back retainer. The wall is built on the same plan as any reinforced wall, only the surface is rock faced, making it unnecessary to give the outside wall any other finish. One of the redeeming features about this system is that one set of cast iron moulds are sufficient for one thousand buildings of any and all designs, only enough for a small section of the building being required as the molds can be moved.

George H. Carlon was elected president of the association for this year, and a more capable man could not have been selected. Prof. Ira A. Williams was re-elected secretary. The work of Secretary Williams at this convention could not be improved upon. D. P. Faus was elected first vice president; James Maine, of Des Moines, second vice president, and J. W. Ross, of Grinnell, Iowa, treasurer.

Nebraska Cement Users.

The Grand Island meeting of the Nebraska Cement Users' Association February 6, 7 and 8, from present indications will be a very successful one in every detail. The committee in charge of the arrangements have used every endeavor for the comfort and education of the exhibitor and cement user.

The headquarters of the association will be located in the Koehler Hotel, directly opposite the Union Pacific Depot. The railroads will give the usual one and one-third rate on the certificate plan. Ample accommodations will be found at the various hotels, the rates of which are quite reasonable, running from \$1.00 to \$2.00 a day.

A large number of manufacturers of block and brick machines, mixers, molds for ornamental work, cars, gasoline engines, water-proofing and coloring matter have engaged space for their exhibits, as have also a number of cement manufacturers and jobbers.

Many interesting papers will be presented on re-inforced concrete, the manufacture, curing and construction of hollow blocks, cement sidewalks,

by such able writers as Messrs. Humphrey, Rice, Miracle, Stout, Summers, Bakker, White and others.

Come to Grand Island with the determination to learn something and teach someone else by asking and answering questions. A good meeting this year, means a better one next year. The annual fee is only \$1.00, so come to this post-graduate course, educate and be educated, and help concrete to maintain its position as the king of building materials.

North Carolina Factory Sold.

WILMINGTON, N. C., January 8.—George W. Kidder and F. Hopkinson Smith have purchased the property, plant and holdings of the Hydraulic White Brick Co., near the S. A. L. depot. The plant is situated in the block surrounded by Front, Second, Bladen and Harnett Streets, and has a frontage of 396 feet and a depth of 264 feet. By the deed of the sale the new firm becomes owners of all patents, rights to manufacture, buildings, equipment, material, etc. The purchase price was \$20,000.00. The new owners will considerably enlarge and improve the plant and will endeavor to develop it into a thriving and prosperous industry.

Little Rock Granite Brick Co.

LITTLE ROCK, ARK., January 15.—The Little Rock Granite Brick Co. was recently re-organized and the following officers are now in charge: Walter Cotter, president; Mord Roberts, vice-president and general manager; T. T. Cotnam, secretary and treasurer. The plant is located on the Arkansas river and their sand costs them practically nothing. The cost of handling it being about 25 cents a yard. They have an immense derrick which drops the steel buckets into the river bottom and swings the sand over on to the land and drops it where it gradually dries. It is next conveyed to the dryer, then mixed with the lime, sent through the tube mills, and is then ready for the hydraulic presses. They have two cylinders 60 feet in length. The present capacity is about 18,000 brick a day. The plant is conveniently arranged and the economy employed in handling the material reduces the cost of production to such an extent that even though lime is selling at 80 cents a barrel the company is able to make a nice profit. In addition to selling many brick for use in Little Rock, they have shipped them to outside points. They are just completing a school house which required 400,000 bricks and recently filled an order for 75,000 at Nashville, Ark.

Mord Roberts, the general manager, is an old engineer and understands machinery. He has made a study of the sand-lime brick business. He says that the brick layers are their friends, because they can lay 25 per cent more of them on account of their uniformity. The future of the sand-lime brick industry as far as Little Rock is concerned looks bright and there is every reason to believe that the Granite Brick Co., will continue to prosper.

Sand-Lime Brick

Building The "White City."

No feature in the new building of Washington is so conspicuous and pleasing as the general predominance of light materials in construction. The National Capital is pre-eminently a "White City," due in a large measure to the large number of government buildings constructed of light colored stone. Private builders were slow in imitating the city's color scheme, so to speak, which was set by the government, but their tardiness in following suit was caused principally by the high price of marble and other light stones. Thus up to fifteen years ago all residences and small buildings in the National Capital were built of red brick.

The introduction of sand-lime brick, which can be made in almost all colors desired in construction and especially with pleasing effect in the buff, light gray and almost pure white, therefore proved to be a great boon to the "White City" movement, which was not inaugurated in earnest until about five years ago. It was soon discovered that the combination of light buff sand-lime bricks with light stone was ideal for buildings of every description. Both architects and builders were quick to appreciate the beauty and merit of the new material and a large number of beautiful residences and other buildings in Washington constructed of sand-lime brick testify to the skill with which the new products were used. The result is that the buildings now going up in Washington have an individuality which each year improves the general appearance of the city. The idea is by no means a fad. The color is popular, chiefly because it is cheery in effect, rivaling in many cases the buildings constructed entirely of stone.

There are other cities in the country, where the artistic side of construction is being developed, which at some future time can also lay claim to the title of the "White City." Sandlime brick manufacturers would do well to watch these ripening fields and be ready to gather the harvest of increased business when it comes. A campaign of publicity as to the possibilities of sand-lime brick could be of advantage to the industry.

Show Plant to Visitors.

SAVANNAH, GA., January 17.—The Savannah Sand-Lime Brick Co. gave an excursion this week to its plant at Eden to show the business men, architects and contractors of Savannah the workings of its plant. John J. Maroney, of Chicago, representing the manufacturers and superintendent, was in charge of the party and explained the details of the plant. Two hours were profitably spent at the plant.

Columbus Firm Elects Officers.

COLUMBUS, O., January 14.—At a meeting of the stockholders of the Granite Sand-Lime Brick Co., the following officers were elected: O. P. Lenox, president; Earnest Beach, vice president; W. L. Curry, treasurer; J. E. Robinson, secretary; O. P. Lenox, C. M. Jones, N. E. Liggett, Calvin Liggett, M. P. Davis, Ernest Beach and C. J. Rausch, directors.

Prominent Canadian Plant.

PETERSBOROUGH, ONT., January 14.—One of the most successful industries in this section is the plant of the Petersborough Sandstone Brick Co. Limited, situated in the southwestern outskirts of the city. The plant is one of the most complete of its kind in Canada, and the bricks manufactured have been highly satisfactory to contractors and builders. Evidencing the popularity of this product, more than sixty houses have been built with it since the Petersborough Sandstone Brick Co. has been in operation, and in addition there is a large number of buildings in Belleville, Hastings, Millbrook, Havelock, Lakefield and Port Hope erected with the product of the company. The plant has a capacity of 20,000 bricks daily. The officers of the company are: President, J. J. English; vice president, J. J. Hartley; secretary, E. S. Clarry.



80,000 GALLON SETTLING TANK OF CONCRETE BUILT FOR ALKALI RUBBER CO., AKRON, OHIO.

CONVENTION PROCEEDINGS.

Report of Chicago Meeting of the Sand-Lime Brick Association is Continued.

(The first day's session of the third annual convention of the National Association of Manufacturers of Sand-Lime Products, held at the Palmer House, Chicago, December 5, 1906, was published in *Rock Products*, December 22, 1906, giving the full text of all the papers of the two sessions, together with a brief summary covering the salient points of the discussion, and according to the agreement with the association, we continue the full report with the morning session of December 6, 1906, and in future issues of *Rock Products* the report will be continued until completed.)

MORNING SESSION, DECEMBER 6.

President W. K. Squier called the convention to order promptly at 10 o'clock, and called upon John L. Jackson, of the American Sandstone Brick Co., Saginaw, Mich., for his paper, which he read as follows:

THOUGHTS FOR THE BEST INTERESTS OF THE ASSOCIATION.

BY JOHN L. JACKSON.

Mr. President, Officers and Fellow Members: When your secretary wrote a short time ago, asking me to prepare an article on the above subject, I took it as a joke and asked him to give it to some one that could do it justice, as writing articles on as dry a subject as this was out of my line. He, however, insisted upon my carrying out his wishes, and I will leave it to my patient listeners whether the joke is on them or the secretary of the association.

Associations are organized for a great many reasons and causes; labor has its association to get increased wages and to better its conditions; employers have their associations for better prices and to do away in a great many cases with competitors usually met with in their particular line; others associate for social betterments and others to improve their conditions. What is and has been bothering me is, to know what we are organized for, as almost every member of our association has his own particular ideas on the subject. We have, among our members, what is known as kickers, because they can not have their way. We should, however listen to their grievances if their stand is well taken and try and combine all the good points this discussion should bring out.

I am going to make a few plain remarks in order to give every member of this association an opportunity to be heard on this subject. If I am personal in any of my remarks, I want those who feel they have a grievance to respond and I will know and feel that my article has done some good.

Thoughts for the best good of the association are many and diversified. First, is this association to transact its business behind closed doors like it had some great secret to hide, or are we to invite our uninitiated neighbor to meet with us and hear what we have to say? This was the stand taken by one association of which I am a member, which was organized for the purpose of asking and demanding our rights as employers; it was open to members only; our membership fell off and I am sorry to say, our employees had a full knowledge of all our proceedings as soon as the members themselves. The by-laws were changed to allow any outsider to be heard at all discussions and meetings pertaining to the betterment of this association, although they could not vote or get any direct benefits from the association which is usually accorded to its members, and therefore soon joined and we are today one of the most prosperous associations.

Second—The time of secrets in the sand-lime or sandstone brick business has long past and today we are throwing open our doors to the public and asking them to investigate.

Third—If these meetings were held for the purpose of suppressing labor troubles, such as strikes, etc., instead of discussing the ups and downs of sand-lime brick making during the past year; a business as honest and legitimate as any manufacturing business you can mention, I would say, "bar

the door," but we have no reason to use that motto, and the use of this motto in the past, is one of the reasons why some of our charter members are not with us today. I would suggest to hold our door wide open, take the skeptic by the hand, lead him to the mourners bench and ask him to become one of us, if not now, at some future time. He may have a sand-lime brick bee in his bonnet; you can't always tell by the looks of a man what his intentions are. I do not see why or where we will be doing ourselves or our associates any harm by making public the proceedings of our meetings. Have not the clay brickmakers held open conventions ever since they organized and is not their association in a very prosperous and satisfactory condition today? Why should we not follow along the same established lines and get into a prosperous condition too? If a member don't want to talk before the convention, I do not know of anything to prevent him from keeping quiet if he has had troubles he does not care to mention to his brother members.

I have heard of members of this association who are in no manner connected with a sand-lime brick plant or a machinery concern, but who had paid their dues, etc., who raised an awful kick because the proceedings of last year's convention were not published by some other medium than the official report so they could have an opportunity to read them soon after the adjournment of the convention at Detroit.

As far as I am individually concerned, I wish to enlighten those who are investigating the manufacture of sandstone brick, and insist upon them visiting the plants in which I am interested. Some of my fellow associates may not feel that way, but that can not be helped as every man has a right to his own opinion, and in this meeting the majority will rule in the end.

Are you afraid to tell your troubles to your brother sand-lime brickmaker in the convention for fear our clay brick neighbors will laugh at you? Do not let him worry you. The green clay brickmaker has his own troubles and a great many of them. If you doubt my statement just read some of the questions asked by them through the trade journals and attend one of their annual conventions and hear their tales of woe. We are on as sound a footing today as the clay man and there is no reason for fear.

Probably some of the gentlemen present are members of some other association and know of their troubles; others of us know only our own because they are before us now.

The sand-lime or sandstone brick has an established place among face brick handled by dealers and known as white face brick. There are more plants earning dividends upon capital invested at the present time, than at any time since the brick were introduced in America. With these facts in view there is no reason for this association to be a thing of secrecy, and lead outsiders to think that there is something wrong about the business that we do not want known.

We must adopt the open shop policy, especially if we expect to continue this National Association. As to the financial end of the association business, let me say a few words. The clay brick manufacturers' association has standard yearly dues of \$3.00 and it has kept on its feet and has its annual meetings regularly with a large attendance. Why should we have such high dues, assessments, etc., if our sister association can live and prosper on so much less? When a member of this association pays all of the yearly assessments, he don't feel like spending any more money to attend conventions by having to travel half way across the continent.

Our membership is falling off for one cause or another and in a short time there will be no one to attend or represent the sand-lime brick business except the officers of the association.

We must furnish some inducement to the individual members to keep them in attendance and not load them down with unnecessary obligations and burn their money.

I have heard from many sources, that former members have decided not to attend this meeting on account of their dissatisfaction with some of the requirements of the association. If this is true, let us try to arrange our by-laws so that we can help our old members and get others to join us. This association like a great many others, is composed of business men, and now let us get together and make our association second to none instead of being away down the line.

Let us discuss every feature of the business connected with our association; if our officers have made a mistake, remember it is not their fault alone but ours. I know they have done all they possibly

could and have been compelled to carry more than their share of the load. Let us divide this load with them and make our association what it should be. I know some of the members are busy men, but no more so than I am. I shall do my duty as a member and when the load gets too heavy, I will step from under and ask some other member to assist me or give up entirely.

In conclusion I wish to say that the officers of this association deserve a great deal of credit for the work they have done, and if we have any bouquets to give away, let them then go to the officers with our thanks.

Continuing Mr. Jackson remarked that Mr. de Joannis had sent out a number of copies of the proposed revised articles of association, suggesting that \$10.00 dues to cover everything in connection with the association's work, would be agreeable to a majority of the members at least.

Mr. Squier took up the question of the assessment voted upon at the Detroit meeting, and explained that it was unanimously passed at the last meeting, after taking great care to give everybody a chance to speak out, but there was not a dissenting voice. He agreed with Mr. Jackson on the point of economy and failed to see how an association could be conducted on wind.

Mr. Carl explained that some of the companies have been in financial difficulties and are not in a position to pay this assessment; that the parties who agreed to the assessment at the Detroit convention, may not now be connected with the firms then represented.

Mr. Randall, the secretary of the Clay Brick Manufacturing Association, said that they charged \$5.00 initiation fee and \$3.00 per annum membership fee, and they now have a membership of 700.

Mr. Mellen called attention to the scientific work necessary for developing the information required by the sand-lime brick manufacturers and the possibility of securing such work through the association more cheaply than the members could do it individually. He suggested that a Bureau of Information, carried on by the association, would be a valuable asset to the brick manufacturer, even if the dues should cost as much as \$50.00 to secure it.

Mr. Duerr moved that a committee of three be appointed to canvass the members and get their opinions on the proposed changes to the constitution as drawn up by the committee. The motion was carried and the president appointed Messrs. Duerr, Jackson and Anderson.

The president then appointed the nominating committee to nominate officers for the ensuing year, as follows: Messrs. L. W. Penfield, Straight, Plummer, Bovy and Mellen.

The president introduced J. Y. Bassell, secretary of the board of trade, Columbus, Ohio, who in a ringing speech, invited the association to hold the next annual convention in that city.

On motion of L. W. Penfield, it was unanimously carried to hold the next annual convention of the association at Columbus, O., December 4, 5 and 6, 1907.

The president announced that in the absence of J. W. Fuller, his representative, Mr. S. U. Moyer, should read Mr. Fuller's paper, as follows:

GRINDING AND THE GRINDERS.

BY J. W. FULLER.

Gentlemen: At the request of your secretary, I have written my views on the question of "The Most Satisfactory Grinding of Sand for Sand-Lime Brick Purposes," and trust you will pardon me if my paper is necessarily somewhat prejudiced in favor of my own machine. I have, however, endeavored to write my views from as disinterested a standpoint as possible.

The question of grinding material has been a knotty problem for a good many years; more particularly so since the manufacture of cement has been largely developed in this country.

One of the principal features of the manufacture of cement is that of grinding satisfactorily, both the raw material and the clinker. It is one which involves a great deal of expense for power and repairs.

There are at the present time various machines in the market, of which the tube mill and the Griffin mill are the most popular. Until recently the tube mill has been the most popular on account of the simplicity of the machine and its small repair charge.

The chief objection to the tube mill is the great amount of power required for output produced,

and also the necessity for first reducing the material intended to be ground to a fine product not larger than 20 mesh before introducing it into the tube mill.

Having lived all our lives in the midst of the great cement industry, the problem of grinding has been brought to our attention. It had been a part of our business to furnish various pieces for various grinding machinery, as well as other machines used in cement plants, and we found that the material produced in our plant gave much better satisfaction than that produced in any other. This led us to feel that we had the right kind of material for making a grinder, and if we could produce a grinder from this material which would be a mechanical success, it might be a great help to the cement industry.

Some years ago we began to make some experiments and these resulted in the development of our Fuller-Lehigh grinder. The grinding principle of the Fuller mill is not new, but in design, construction and material, in connection with its other features, it is entirely new.

Three years ago we placed on the market our first machine, and the present machine which we are now manufacturing, is the development of our first experience. The success we achieved was so encouraging that when we found the sand-lime brick industry was in practically the same position as the cement industry, we induced the Diamond Stone-Brick Co., of Wilmington, Del., to try one of our machines, for we were given to understand that their results with other grinding machinery had proved extremely unsatisfactory.

In January last the said brick company decided to abandon the tube mill which they had been operating for some six months, and they installed one of our machines. On investigation, we found that the material which they had to grind was a bar sand consisting of almost pure quartz, pebbles highly polished, which is, unquestionably, the most difficult material to grind.

The best result they had obtained in grinding this sand in a 16 ft. tube mill was 1,400 pounds per hour, 90 per cent passing 100 mesh sieve. In grinding sand and hydrated lime together, they had met with considerable difficulty by reason of the material packing in the tube mill, and consequently very little grinding was accomplished.

When the Fuller mill was first installed at that plant, hydrated lime and sand were introduced into the mill at the rate of 4,000 pounds per hour, and we soon found that the machine could readily take care of this and much more. This amount was gradually increased until 6,000 pounds per hour was produced, all of which passed a 80 mesh sieve, 90 per cent passed a 100 mesh sieve, and 75 per cent passed a 200 mesh sieve; to do this required 32 h. p. Some difficulty was experienced in the early stages on account of excess moisture in the lime clogging up the screen, and also packing of the material under the sweep, but this was not of a serious nature as the port-holes in the machine could readily be opened, the packed material removed, and the screen easily cleaned.

After several months' running in this manner, the brick company changed from hydrated lime to caustic lime, grinding the lime and sand together, the lime having first been crushed to a size not larger than a hickory nut. Since this change has been made there has been no clogging of the screen and no packing of the material, the machine has maintained its output, and the horse power has been down to 27 although the average horse power required is about 32.

I recognize the fact that one of the first questions you will ask is, "How about repairs?"

The cost of repairs is undoubtedly higher than that of a tube mill; but when you compare the cost of repairs and the horse power required with the cost of repairs and the horse-power of a tube mill, and reduce that cost to output per ton, you will find that it is decidedly in favor of the Fuller mill.

It is difficult to tell you what your grinding is going to cost you as no two materials are alike in grindability. The fairest method is to take a comparison of the tube mill and the Fuller mill under like conditions, and we have no better example of this than the experience of The Diamond Stone-Brick Co.

The average output per hour for six months running which that company had obtained in the tube mill was 1,400 pounds at a cost for power and re-

pairs of 55 cents, or 80 cents per ton of materials ground. The average for eight months running on the Fuller mill for power and repair was 26 cents per ton. Therefore, if you have a plant making 20,000 brick per day, which is equivalent to 50 tons of material, and you grind one-third of this, or 17 tons, there is a saving to you in the use of the Fuller mill of \$9.18 per day, which in itself is a fair profit. (When you consider the capital, cost and interest, this is even greater.)

The tube mill capable of grinding an equivalent to one Fuller mill, will cost you set up in place at least \$3,500.00 as against \$1,750.00, which is not only quite an item on the original investment, but in your interest and depreciation charges. If floor space is an object, a space about 15 x 35 feet is required for a tube mill, as against $4\frac{1}{2}$ x $4\frac{1}{2}$ feet for the Fuller mill.

The principal wearing parts of the Fuller mill are the grinding rings and balls, pushers and screens. A screen can be replaced in one hour; a pusher and ball can be replaced in two hours; the entire machine can be taken down and a new ring put in, so as to be ready for operation, in five hours. Thus the machine need not be idle for more than five hours at any one time.

One of the essential requirements of the sand-lime brick industry is an absolutely perfect mixture.

In passing sand and lime through the Fuller mill you get an absolutely perfect mixture, in fact, so much so that the mixture coming from the mill looks like one ingredient.

I have here for your observation, samples of sand and lime going to the mill, and samples of mixture coming from the mill, and these you may judge for yourself.

One strong feature in favor of the Fuller-Lehigh mill is that you can rely absolutely upon the uniformity of your grinding, as it is impossible for the material to leave the mill until it has been ground to the fineness which you require in your work.

Mr. Duerr tells us that where caustic lime and sand are ground together with the intention of adding the water after it leaves the mill, the conditions of the material, owing to its temperature when it leaves the mill (about 210 degrees Fahr.), is particularly desirable; as the material at this temperature is susceptible of more ready and easy hydration than it would be at lower temperature, and that in four months running it has had no difficulty with expanded or cracked bricks.

In conclusion I wish to say that there is no industry that is more exacting in its requirements for grinding than the cement industry. And our pronounced success in this field encourages us in the belief that we have a pulverizer second to none on the market today.

At the present time we have our mills installed in fifty-three different plants, grinding various materials, and we must say we have had most gratifying reports.

I thank you gentlemen for your courteous attention.

R. C. Penfield remarked that the paper just read was on the Fuller-Lehigh mill and stated that he had seen the beautiful product it made which could not help but commend itself when a manufacturer of sand-lime brick wanted a fine ground mixture of sand and lime. He spoke of the tube mill and its well known standing as a pulverizer and called attention to the splendid records which exist in a large number of plants throughout the country.

Mr. Simpson wanted to know how long the balls and pusher will last and the cost of renewing them.

Mr. Moyer promptly replied that the wearing part, which are the balls, cost about \$7.00 each or \$28.00 for each mill and the pushers cost \$2.80 each. The life of these parts depends greatly upon the character of the material to be ground.

Mr. Duerr, who has used this mill, stated that the pushers lasted twice as long as the balls, and the balls last about three weeks. Then Mr. Moyer promptly and carefully answered a number of questions propounded by the gentlemen of the Association.

Mr. Ransom remarked that it is not always true that the higher per cent of the silica in your sand, the harder your sand. It depends on the nature of the silicates present; some of the silicates being harder than silica itself.

R. C. Penfield said: "The practical tube mill man does not consider anyone's opinion on the subject of sands or silicates of much moment. He takes a sample of every lot of sand and tries it to show exactly what the tube mill will do in practice. There is no way to judge what any machine will do until it has been done."

L. W. Penfield summed up the whole discussion about grinding machinery, by stating that there are two classes of grinders; the Griffin mill, the Kent mill, the Kominuter and the Fuller-Lehigh representing one class, and the tube mill another. The first four are much alike and they are all entirely different from the tube mill. While used in some places for the same purpose, in one place the tube mill will excel in its results as a fine grinder, and the Fuller-Lehigh mill under other circumstances will excel the tube mill. A tube mill is a finishing mill when it is used as a pulverizer, but incidentally it does considerable pulverizing when used as a mixer, which is the case in sand-lime brick plants.

Mr. Moyer admitted that the Fuller-Lehigh mill was not of the same type as the tube mill. As to the mix, the only mix he could speak of with experience was the one he saw at the Diamond Stone Co.'s plant. It is a thorough mix, and the sample of the product here speaks for itself.

Mr. Bovy asked how much power does a 5x22 ft. tube mill take.

Mr. Straight answered about 27 h. p.

Mr. Bostwick stated that he had been running a tube mill for fourteen months and it takes 500 pounds of coal a day, which costs \$1.80 a ton. He explained that after they developed a plan for preparing the material, so that the tube mill will handle it, he had uniformly had satisfactory results.

Mr. Whetstone: My experience is that costs of this kind invariably come back to the kind of material to be reduced, and, that you can not compare materials.

Mr. Carmichael stated that it required 25 h. p. to run the Denver plant, and bearing out Mr. Whetstone's statement that the advantage of the wet pan is that you get all of your lime and a portion of your sand and use the batch mixture and this gives an opportunity to grade the mix by actual observation.

Mr. King: We run a dry pan. It takes about 22 h. p. We figure that we get 12 per cent of material that would go through a 100 mesh screen. We have never put a dollar's worth of repairs on it.

Mr. Bovy: I would like to know what is the cost of repairs on tube mills.

R. C. Penfield: \$200.00 a year covers the repairs on tube mills when operating in a sand-lime brick plant.

Mr. Duerr: Our experience with the tube mill is no criterion, as we ran it but six months. We used a ton of pebbles a month the time we were running. They were Norway pebbles costing \$25.00 a ton.

Mr. Straight: I have no exact figures with me, but we run our tube mill ten hours a day and the cost of running does not reach \$100.00 a year. I should judge it did not exceed \$75.00.

Mr. Moyer: As has been stated before, there ought to be tests made of the grinding of the particular material and a careful estimate made of the cost. It would be easy to test the fineness of the ground material, as well as the horse power required to run it. We will be glad to receive a sample of your material and to grind it for you. We can then tell you what the mill will do in the way of fineness and all that kind of thing.

The secretary wanted to know how large a sample was necessary to have such a test made.

Mr. Moyer: I would not consider a test fair, unless we would run the mill at least half an hour or more and I should think that would require a ton or a ton and a half of sand to make such a test.

On motion of Mr. Bovy, the meeting adjourned until 2 o'clock.

(Rock Products, February 22, 1907, will contain the afternoon session of December 6.)

The Silica Block and Brick Co., of Brooklyn, N. Y., has been incorporated with a capital stock of \$25,000.00. The incorporators are: Hugh Moore, Frank Lyons and Harold Sommers, all of Brooklyn.

In Behalf of National Reciprocal Demurrage

In the December 22 issue it was our pleasure to call your attention to the convention of shippers called for January 4, in Chicago, to take some action to gain the relief needed, owing to the inability of the railroads of the country to furnish sufficient cars to take care of shipments or when the cars were provided to deliver them to their destination in any reasonable time.

The meeting was held in Chicago with 225 delegates representing thousands of shippers, and the meeting was enthusiastic and satisfactory. S. P. Anderson, of the Anderson-Tully Co., of Memphis, was elected permanent chairman and J. E. Defebaugh, of the American Lumberman, of Chicago, permanent secretary. The various phases of the car shortage were discussed and, fortunately for the progress of the organization, the possibility of securing action by the government through President Roosevelt has been assured. The transactions of this body were of the friendliest sort, and that you may have some idea of the efforts made for the benefit of the trade we quote from the Executive Committee's report or address to President Roosevelt, presented January 16, at Washington:

"The convention declared itself unequivocally in favor of the principle of reciprocal demurrage and of urging upon Congress the immediate passage of a law which would enforce that principle, on the ground that it is the right of the shipper to exact demurrage from the railroad if demurrage be exacted by the railroad from the shipper. The attitude of the convention is further expressed in the following preamble and resolution, the latter being the basis of our authority:

"WHEREAS, The steadily increasing delays in the handling of the freight traffic of the country have caused untold damage to shippers, buyers and railroad companies; and

"WHEREAS, No federal law now prevails to govern this question that deals justly as between the parties interested; and

"WHEREAS, This convention is desirous of being just to the railroad companies, as well as to shippers and buyers; and

"WHEREAS, It is the expressed sentiment of this convention that it is to the best interests of the commercial enterprises of the country, as well as to the railroads, that a national reciprocal demurrage law be enacted; therefore be it

"Resolved, That a permanent executive board be created by this convention, to consist of seven members, which board shall have the power to add to its membership one representative from any association sympathizing with the movement of this convention; and that it be the duty of that committee to proceed at once to Washington and there to lay the sentiment of this convention before the proper authorities; and that thereafter the same committee, with the addition of the other members who may be added, proceed to collect the necessary data in order that they may be laid before the Interstate Commerce Commission, or as Congress or the president shall direct."

"The convention amended this action by unanimously adding as ex officio members its president and secretary, thus making the committee nine in number.

"Now, Mr. President, in behalf of this body and in accordance with its instruction, particularly expressed in another resolution, we respectfully request your aid in behalf of amendments to the Interstate Commerce Act as it stands today, such as we believe will greatly strengthen it and make it a more efficient instrument in correction of long standing abuses and in the relief of a situation which has become chronic and in its acute stages threatens the prosperity of the country.

"The seriousness of the present situation you apprehend, but we feel that you can not so fully understand its gravity as those do who daily face it.

"In sober truth, not only are all the business interests of the country experiencing great loss, but in some sections many are facing serious financial trouble. In the lumber industry alone

hundreds of mills are shut down, with their active capital exhausted, and facing pressing obligations, to meet which they must depend upon selling their product, for the moving of which the railroads do not furnish sufficient cars. Hundreds of coal mine owners are in the same position. Labor has not been employed in mining coal in many districts more than half time during periods extending from six to eight months each year, mines operating one and two days a week which should run at the rate of six days a week during nine months of the year. There have been times in the last year when mines have not been supplied with any cars during a whole month. This condition causes great suffering to those employed at a fixed wage a ton for mining coal. Thousands of farmers, especially in the northwest, have already met what are to them heavy losses from the same cause, and practically every producing industry in the country, especially those conducted by numerous private firms or corporations, are directly and seriously affected.

"It is the conviction of your petitioners, after serious consideration, which is, we believe, untainted by any feeling of animosity toward the railroads as such, that the railroad management of the country has in many instances failed of its purpose, owing to conflict of interests governing their equipment as between themselves, at terminals. While recognizing the large growth of business, it is the belief of your petitioners that these conditions are due, in part or in some cases, to antiquated methods of conducting the business; in part or in some cases to a lack of the enterprise and foresight which has been displayed by other industrial and commercial interests; in part or in some cases to the influence of financial interests which have been willing to curtail their duties as common carriers in favor of their own greater profit.

"We have framed no bill for presentation to Congress and have no arbitrary demands to make, but we have some suggestions as to the things which could be accomplished by such a measure and as to some methods by which they might be accomplished.

"The transportation service is one; but it presents itself in two parts. First is the furnishing of suitable cars for the transportation of car load commodities; second, the movement of cars to destination when loaded. Failure in the last is largely responsible for failure in the former.

"Prior to the establishment by the railroad companies of their car service associations one of the greatest hindrances to the movement of freight lay in the habit of consignors and consignees of unduly delaying the loading and unloading, respectively, of cars in their possession. Consignors made a practice of ordering more cars than they needed for current loading of their commodities, while consignees made use of equipment for storage purposes. The car service bureaus, to limit these abuses, devised so called demurrage rules and charges, which at the present time, in most cases, allow forty-eight hours for loading or unloading a car, after which further detention subjects the holder of the car to a charge of \$1.00 for each twenty-four hours. This charge, whose justice is admitted, has greatly ameliorated the evil, but not entirely abolished it, because sometimes it seems more profitable to pay \$1.00 a day for detention of a car than to dispose of it properly. But, on the other hand, the railroads have in no practical way recognized a corresponding obligation to move with reasonable promptness the tonnage accepted by them as common carriers, but have recognized the principle of demurrage in the publication of their tariffs as required under the Interstate Commerce Act.

"The great interests which we represent, while acknowledging the justice of demurrage rules as applied to themselves for unnecessarily and unreasonably detaining the equipment of the railroads, believe and assert that justice demands that equivalent charges be made against the railroads for unnecessarily and unreasonably detaining our commodities while nominally in transit.

The application of this principle we call reciprocal demurrage.

"Respectfully submitted,

VICTOR H. BECKMAN, Chairman;
J. E. DEFEBAGH, Secretary;
S. B. ANDERSON,
HAL N. SMITH,
E. M. WAYNE,
E. M. WASMUTH,
J. A. VAN HOOSE,
C. I. MILLARD,
DONALD SAGE,
S. P. HOSTLER,

Executive Committee, National Reciprocal Demurrage Convention."

The result of this trip to Washington by the committee was a conference with the President and Chairman Knapp, of the Interstate Commerce Commission, after which the Commission met the committee as a whole and after a conference the report of the two committees was submitted to the President, who promised to recommend it for action in some form which seemed best to him at an early date. Thus the conference called and held on January 4 is now before this aggressive head of our government who, no doubt, will assist materially to relieve the situation that has hampered every industry in this country in the past eight months.

Let us hope that the relief will come speedily, for the business of 1907 from all appearances will be even larger than that of 1906, and that the railroads will move their cars faster than an average of 28 miles a day, and this would materially assist the shippers to get cars. If the President decides to recommend the law as a part of the Interstate Commerce Commission's red book that will impose a demurrage on the railroad for not promptly handling the freight of the shipper the business of this country will be greatly assisted.

The South Bend Machine Manufacturing Co., calls special attention to their hand power standard mixer, which has a capacity of thirty cubic yards a day and mixes more thoroughly than it possibly can be done by hand. This little machine was especially designed for the use of concrete block and brick factories, and every one in use has given entire satisfaction according to the testimonials received by the manufacturers. This same company also builds standard line of cement brick moulding machines which have made a splendid record in the present year.

The Power and Mining Machinery Co., of Cudahy, a suburb of Milwaukee, Wis., in conjunction with the Snow Steam Pump Works, of Buffalo, N. Y., has opened a new sales office at 719 White Building, Buffalo, where will be handled the several types of gas generating apparatus, such as the Loomis-Pettibone system, suction and pressure gas plants, built by the Power and Mining Machinery Co., and the Snow gas engines, built by the Snow Steam Pump Works. Seward Babbitt, sales manager of the first named concern, will make his headquarters at the Buffalo office, on account of the facility of conducting business from that point.

WHAT Jupiter Pluvius has been doing to the Ohio and Mississippi valleys with the recent floods is a plenty, which suggests a thought upon the actual crude state of our internal development. A few Dutch engineers from old Holland, with money to buy cement and labor would put flood conditions out of business in short order, and thereby conserve the millions that are lost forever every few years by the devastating waters. It also means a wholesale use of materials which will keep the mills grinding for quite a while. We need every drop of this water if we only knew how to use it as well as Dutchmen do. It took them centuries to develop their system of canals and dikes, but their learning upon this subject might be easily applied to our requirements with no wonderful amount of ingenuity.

Lime.

The National Lime Manufacturers' Association.

Meets Semi-Annually

Peter Martin, Huntington, Ind. President
 O. F. Perry, New York City First Vice President
 W. B. Hill, Kansas City, Mo. Second Vice President
 A. A. Stevens, Tyrone, Pa. Third Vice President
 C. W. S. Cobb, St. Louis, Mo. Treasurer
 B. H. Delebaugh, Louisville, Ky. Secretary

EXECUTIVE COMMITTEE:

Chas. Warner, Wilmington, Del.; O. W. Robertson, Milwaukee, Wis., and the President.

Official Organ, ROCK PRODUCTS.

The National Lime Meeting.

You have already been advised that the annual meeting of the National Lime Manufacturers' Association will be held at the Southern Hotel in Columbus, Ohio, February 4 and 5. The first session will be called to order at 9:00 a. m., Monday morning. Try to arrange to be on hand so you will be in attendance at every session of the Convention.

The program prepared is one of unusual interest and the acceptance by a number of experts in their particular line to make addresses should bring you to Columbus. It has been the desire of the Executive Committee to cover matters of special interest through these addresses, from the operation of the quarry to the selling of the by-products of the kiln, and the lime manufacturer who really wants to prosper must of necessity take interest in the educational features of his own industry, for without exchange of thought between manufacturers, either as to methods of operating the plant or as to sale of the product, the manufacturer will get less out of his investment and have less satisfaction in operating his business. Arrange to be on hand early and stay late.

The probabilities are there will be three sessions Monday and if the work can not be concluded it will continue over until Tuesday, but because of the fact that there will be several hundred dealers and a large number of manufacturers at the National Builders' Supply Association, it seems wise to endeavor to get through with the work of the National Lime Association meeting on Monday, if possible.

Selling Lime.

There seems to be an impression in some quarters that the most aggressive people in the business are not securing the best top-notch prices for lime. We were surprised to find in a dealer's office the other day that the price for hydrated lime was 10 per cent. higher than gypsum, but it evidenced the fact that some good salesman had been getting in his work. Salesmanship in the lime business is as much of a necessity as in any other line, but what still needs your attention is the fact that manufacturers do not compare notes. We have a letter on our desk to-day commenting upon one of the most enterprising men in the lime business quoting a price in a certain territory which is less than it should be and the local manufacturer was complaining bitterly. Yet that same manufacturer is so busy at home operating his plant that he has not time to get acquainted with the man who is making his price for lime cheaper than he should. We have had experiences at National Lime Association meetings where two manufacturers who had been antagonistic to each other for years have patched up an agreement and the result is they have both

made more money out of their trade and sold more lime, but a man cannot sit at home and look through his own eye glasses and tell what is doing. He can be deceived by the dealer and probably the other man has not been getting the price at all. We have known it to happen many a time where a manufacturer who thought he made the best material on earth did not have time to go out among his customers personally or meet his competitor, found he was being fooled both by his salesman and his customers. This is not always the case, but it happens oftener than people are willing to admit.

Of course the law of supply and demand controls values in almost every line except where the operator is aggressive and has his sales department organized and is giving his attention to the manufacturing end of his business. We know people in particular lines who make better goods than anybody, but get lower prices than a cheaper grade material because they are not in touch with the trade. We have seen manufacturers in this particular line practically retire from business after making a fortune, because they continued to operate on methods that were all right fifteen years ago, but obsolete to-day. There is no time like the present to prepare for the application of better methods for selling your lime in 1907 and if the 100 manufacturers who have been actively connected with the National Lime Association made a common push to get the top notch price for their lime and to prepare it especially for particular trades and then furnish these trades with what they wanted and when they wanted it there would be less complaint about the price either by the buyer or the seller, and there is more reason in this than you will possibly admit, but we hope you will take this thought to yourselves, that it is Rock Products' impression that you are not giving enough attention to the selling end of your business.

Does it Pay to Retaliate?

When the manufacturer gets it in the nose from the dealer either on a contract or short weight or something else he generally makes the remark, "Well, we have so much capacity and we can cut that market wide open." Rock Products has always contended that this was a mistake. There are other ways of getting even or making the dealer realize that he has done an unscrupulous thing besides putting a low price in the market and spoiling the business of everybody. As a general proposition retaliation in the way of cutting prices generally comes home to roost. It is so much harder to advance a price than to lower it. The man who has to sell goods, no matter where, hesitates a long time before he decides to open up the price in a particular territory, but there are two sides to every question. There is no reason why the dealer should not appreciate integrity in his transactions and thus eliminate the desire on the part of the manufacturer to retaliate, or vice versa. The dealer is a long ways from being the worst factor in the business. In fact, the manufacturer often does things that he ought to be ashamed of, but there is a place for both manufacturer and dealer and when equity is applied to the conduct of a business, either in buying or selling, there is no reason for retaliation and the trade is not disturbed and the consumer pays a fair price for what he buys.

Scarcity of Labor.

We met a lime manufacturer the other night who had just been down to the docks and secured some wild "furriners" to take them to his plant because of the scarcity of men. He said "I could use 100 good men, but, by Jove, I cannot get them. Therefore, I find it necessary to pick up some greenhorns coming from the other side, and it is no easy job to land them either. I find some labor employment man has coaxed them off or after getting advance money they conclude they do not want to go away from the seaboard or for some other reason it is necessary to almost keep them under lock and key until you get them to your plant and even then you are not dead sure you have them. At other times, not understanding the meaning of a moral contract, the laborer skips by the light of the moon and the quarryman is left high and dry without men. This applies in any line where foreign labor is at work."

Lime Economy.

One of the problems of the lime manufacturer to-day is to secure the greatest burning capacity, at the least cost and, technically speaking, because of lack of methods to determine exactly what the old kiln is doing. In some cases they are making a nice clean loss on fuel because of lack of closer attention to what the kilns are doing. One of our friends using gas has had the greatest fuel efficiency of any kiln we know of until a few months ago, but a recent examination of the workings of the kiln showed that there was quite a little loss and when we asked the foreman what the trouble was he said he did not know. In fact he thought he was getting the same efficiency he had six months ago. The applications of appliances to determine these absolute figures are as necessary as to get your labor costs and every other feature, in order to determine the exact cost of your material and thus add to this the profit necessary to fix your selling price intelligently so that at the end of the year the kiln will show a profit rather than a loss.

Economics and By-Products.

There is a problem that confronts every lime manufacturer after looking over his trial balance that should be worked out as a general proposition, and the expense divided by those particularly interested in this proposition. There has been a good deal of conversation as to what might be gained by taking advantage of the by-products of the lime kiln, but unfortunately there has been but little progress made in figuring out a profit here and there from this point of view, and it is due entirely to a lack of effort. It is natural enough for the man who is conducting a crushed stone business, selling lime and looking after the quarrying, manufacturing and selling, not to have time enough to study the economics of the proposition except in the regular channels. Now, it is becoming the lime man that he assign these problems to some one connected with the institution who will use the text books and the experience of others in other countries and those at home as stepping stones to the solution of these problems and not wait until next year to do it, but do it now. If we, in 1907, can show that the lime industry has grown in the technical end as well as the commercial end, greater technical ability applied to your institution will mean greater commercial progress. If you would but consider this matter in all its phases at the national lime meeting you would be benefited. If a dozen men can be gathered together who would put up their money and spend their time, as well as hire some one to give this matter their attention, then four or five can do it. Suppose they do spend \$3,000.00, they would get it back ten times over if the effort is made intelligently and one of the special engineers who has informed himself on this subject has been put to work on a specific task to be worked out for an equivalent.

Integrity of a Contract.

A manufacturer complained the other day that he made contracts last year with buyers who did not live up to them because some other manufacturer came along and offered to cut the price 2 cents or 3 cents a bushel on lime and wanted to know what should be done. Rock Products' thought, was that when a man makes a contract he should live up to it. Notwithstanding the holes left in laws made by lawyers, generally there is a way of forcing a man to take goods when he orders them and contracts to take them, and the sooner a contract is considered binding the better it will be for the industry.

Silas F. Wild, one of the oldest of New York State's lime manufacturers, and later superintendent of quarries at Tuckahoe, died January 17 at his home at Pleasantville, New York.

The White River Lime and Stone Co., of Guthrie and Gulon, Ark., has been incorporated with a capital stock of \$210,000.00. The incorporators are B. F. Lazenby, of Gulon; H. W. Pentecost, of Guthrie and John J. Garetson, of Wentworth, Mo.

Growth of Production.

The enlarged business in building material lines has been helped in the lime trade and with a comparison of notes made in this year of 1907 it will be seen that the production of lime has been largely increased. The equipment, perhaps, may not be much larger, but the application of new methods in burning lime, especially in the installation of new kilns, has put manufacturers in a better position to cater to the enlarged trade. One manufacturer remarked the other day that he would manufacture 5,000,000 bushels of lime in 1907. That is a lot of lime and it means thousands of dollars invested in quarry property and lime burning equipment, and that is merely one case of enlarged capacity. Of course in figuring up so many kilns with so much capacity it is a good deal like figuring out the tonnage of battle ships on paper. Unless you know whether the kilns in commission do the work figures do not always mean what they seem, but a kiln here and there, in addition to the endeavor of the lime man to make an old kiln of greater capacity and efficiency, has enlarged the production. Now with the increased trade and the production to take care of it seems that the greatest problem before you to-day, Mr. Lime Manufacturer, is to get closer to the man who competes with you and see if you can not make the consumer, through the dealer, pay a few cents a bushel more. Certainly your fuel, labor and incidental expenses are no less and if the lime trade is affected as every other manufacturing industry you will find that even 3 cents a bushel advance on your lime will be absorbed in increased expenses. Therefore this enlarged capacity means enlarged expense and must of necessity secure a higher price in 1907. If you will take advantage of the lesson taught in other sections, and they have succeeded because they have been broad-gauged enough to get closer together, greater dividends will follow your efforts in 1907.

Unsolved Problems of Lime Industry.

In his study of the Technology of the Lime Industry published in Bulletins 4 and 5 of the Geological Survey of Ohio, S. V. Peppel gives the following as some of the many unsolved problems in the lime industry, both to the manufacturer and the scientist, as showing how nearly untouched is this field of research:

"First. How to utilize the fine limestone that accumulates about most lime plants.

"Second. How to get the most economy out of fuel.

"Third. What new uses can lime be put to in order to maintain production?

"Fourth. How can further and more conclusive evidence be produced to show the relative values of the different limes for any given purpose?

"Fifth. Does the sord cement reaction enter as a factor in the strength of dolomite lime mortars?

"Sixth. How can complete hydration of dolomite limes be accomplished on a commercial scale?

"Seventh. What is the behavior of limestone and dolomite calcined at temperatures beyond 1200 degrees C.?

"Eighth. What is the behavior of magnesite calcined at temperatures from 350 degrees C. up, by steps of not over 50 degrees C. each?"

Have Purchased New Quarry.

EGG HARBOR, WIS., January 19.—C. A. Speaker & Son, of Schiocton, have purchased the entire property of L. D. Thorp & Son, and will at once proceed to develop the stone quarries, and also carry on the manufacture of lime upon a large scale.

New Plant for Alabama.

DECATUR, ALA., January 15.—George A. Nelson, of Moulton Heights, is the owner of two limestone quarries on the Southern Railroad, near Trinity. Work of construction is already under way for the installation of an up-to-date lime kiln, and ample transportation facilities both by water and rail are already provided.

The Tobey Lime Co., has been incorporated at West Stockbridge, Mass., with a capital of \$16,500.00. G. E. Tobey, president, F. C. Tobey, treasurer, West Stockbridge.

Marketing Your Product.

What are you doing with your lime? How are you marketing your product? Owing to the many improvements in the manufacture of this commodity in the past few years you have been doubtless not paying much attention to this question. Have you realized that you can add much to your bank account during the year by marketing your product in localities where you can do so at the least expense to yourself?

This feature of the industry may have presented itself to some manufacturers of lime during the past year on account of the inadequacy of transportation facilities and the resulting delay in shipments. If your customers have been at points remote from your plant you doubtless have experienced difficulty in keeping your business up to the notch of former years. A customer, who has handled your product for years and whose business relations with you have been pleasant, would doubtless hesitate before ordering his supplies from another manufacturer even if your shipments were delayed somewhat. But all your customers are not of this class, and with the demand for supplies as strong as it has been in the past year, and the car shortages as serious, he well may look to a manufacturer nearer home for his product.

Now, in this state of affairs, with no promise from the railroads that there will be any betterment of car shortage conditions soon, it behooves the manufacturer to study this question of marketing his product thoroughly. It may be that he can find a market near home that in former years he has overlooked because he has been dazzled by handling big contracts. The demand from these markets may be small, but it is well worth looking after, and a manufacturer may find in the end that he can market his product to better advantage by paying attention to these little bits than by going after the big contracts. Of course this will not apply to all manufacturers and we can not attempt to apply it to any particular case; but this article is written in the hope that some manufacturer may be encouraged to study this question of marketing his product thoroughly. He may discover a means of increasing his bank account.

Take a look about you, Mr. Manufacturer, and see if you can not find a place where your lime can be used in some other lines than in those to which you have been catering. Of course you probably are giving the greater share of your attention to the building end of the game, but there are others that might furnish you a good market. Are any glass plants in your immediate vicinity? Do you know of any one near you that is using lime as a carrier for chemicals? Are there any gas purification plants in your city? Are there any tanneries that might be induced to use your brand of lime instead of some other? Can you not increase the sale of your lime for fertilizing purposes? These are only a few of the industries in which lime is used. Such an investigation may not result in any increased sales, and then again it may. It is worth while considering at any rate. Remember, too, that one of the best ways of developing and reaching a market is through publicity and that Rock Products goes to all parts of the country and reaches the little fellows as well as the big fellows.

Virginia Plant Changes Hands.

BUNKER HILL, VA., January 12.—The lime kilns and limestone lands of S. Cline, have been purchased by J. D. Baker, of York, Pa. Mr. Baker will at once erect additional kilns for the manufacture of lime which will be carried on extensively.

Will Develop Idaho Property.

BOISE CITY, IDAHO, January 11.—Frank Nelson is interested in the development of the extensive limestone deposits at the mouth of the Durkee canyon. The limestone is said to be all of a good quality and after getting into the body in quarrying it is understood that there will be no admixture of other rock that must be thrown out, but that all the limestone may be burned to high grade lime. Mr. Nelson will proceed immediately to the erection of a plant and the lime deposits between Baker and Huntington which have been worked successfully on a small scale, will develop one of the biggest industries of Baker county.

Receiver for Lime Concern.

FREDERICK, MD., January 8.—William J. O'Brien, Jr., of Baltimore, was yesterday appointed receiver for the Frederick Lime and Stone Co., after the company had been adjudicated a bankrupt with its consent. The company was incorporated in New York but has its principal place of business in Frederick. The liabilities of the company are alleged to be \$40,000.00 and the assets consist of land and stone quarries in the eastern suburbs of Frederick. It is understood that the company will be re-organized to crush stone for concrete work. J. E. Kennedy, local manager of the plant, has been requested by the receiver to continue operation of the plant.

Hydrated Lime for Far East.

DULUTH, MINN., January 12.—The popularity of hydrated lime seems to have invaded even the far East. The Clyde Iron Works, of this city, recently received an order from an exporting company for two of their hydrating machines, which will be installed at Yokohama, Japan. This is regarded by those well versed in the lime business as another indication of the Jap's ability. "All we need to do now," says L. F. Bruce, manager of sales for the company, "is to sell in South Africa and the circle will be complete."

Rushed With Contracts.

BURLINGTON, VT., January 12.—The A. C. Hathorne Co., roofers, have completed their contract for the new high school building at Ticonderoga, N. Y., and are now busy with the new electric light station at Bolton Falls for Sanderson & Porter of New York, and the new Catholic church at Enosburgh Falls. Their contracts will carry them well into the spring months.

Purchase Big Properties.

MARION, O., January 15.—The Ohio and Western Lime Co., of Huntington, Ind., has just closed a million dollar deal. The Norris and Christian Stone and Lime Co. and The Central Ohio Lime and Stone Co. are now controlled by the Ohio and Western Lime Co. The only Marion company which has not gone in the merger is the John Evans Lime and Stone Co.

Install Another Hydrator.

LUCKEY, O., January 11.—The Clyde Iron Works, of Duluth, Minn., will shortly install for the Luckey Hydrated Lime Co., of this city, another hydrating machine for their plant here. This machine will give the Luckey company a capacity of fifty tons of lime a day of 10 hours. They are well pleased with the growing demand for hydrated lime.

Maryland Quarry Sold.

HAGERSTOWN, MD., January 13.—The Eakle-Wyand Lime Co. has sold its extensive quarries and kilns near Eakle's Mills, Washington county, to Stickley & Orndorff, of Strasburg, Va., on private terms. Upon the property is a Coleman patent kiln capable of burning 350 bushels of lime daily, which will be run to its full capacity.

Have Healthy Demand.

KANANASKIA, ALBERTA, ONT., January 7.—The Loders Lime Co. report: "We are installing three new steel kilns for the burning of lime. The demand is greater each year. We manufacture White Marble Lime for plastering work alone, and excellent lime for building. We can sell all we manufacture."

Will Make Improvements.

CANAAN, CONN., January 10.—The New England Lime Co., has had the biggest year in its history. Orders are being received at the rate of 5,000 barrels a day, one order alone calling for 15 car loads. The Company is about to expend \$15,000.00 in improvements.

Standard Lime and Stone Co., Rockland, Fond du Lac county, Wis., by E. H. Lyons, president, and W. A. Titus, secretary, filed an amendment increasing the capital stock from \$75,000.00 to \$125,000.00.

Cement.

Go to Columbus Meeting.

The time is now rapidly approaching when the cement manufacturer must get busy and put into practical working his plans thought out during the last month of 1906.

The old adage of "The early bird, etc.," still holds good; the question is just where to lay hands on the "worm." Of course, building permits are being tabulated, possible contracts for bridges, dams, reservoirs, conduits, tunnels, etc., are looked up for possible cement requirements, but the pulse of the requirements for the year 1907 is the dealer in building material supplies. The dealer in builders' supplies is a known quantity so far as stability and dependence are concerned. His credit rating doesn't fluctuate as does that of a contractor who sometimes takes a chance of win or lose on a large sized contract, practically forcing those who sell him materials to take the same chance.

The Convention of the National Builders' Supply Association, to be held at the Southern Hotel, Columbus, Ohio, February 6, 7, 8, 1907, promises to be the most successful in the history of the Association. Among the important subjects to come up for discussion will be market conditions and outlook for the new year. Cement is one of the commodities handled in enormous quantities by the dealer, and the dealer is certainly better qualified than any one else to be thoroughly in touch with the conditions in his own territory.

With these facts before you, Mr. Cement Man, it would be well to have your representative on the ground to talk over matters for the year to come, which certainly promises to outstrip the one we have just passed through. Get in personal touch with the dealer, the man who can be depended upon to take the quantity and pay the price agreed upon; two conditions which mean much in the way of smooth sailing in figuring the disposition of output and the collection of money for pay-rolls.

Admirable Market for Cement.

Since the British occupation, South Africa presents an admirable market for cement, because of the new life infused through the building of harbor extensions, railways, sanitary projects, etc. England takes care of about 50 per cent. of the consumption, due, it is claimed to the uniform quality of their product.

The one factory in South Africa, at Pretoria, was a failure up to a year ago, when Ezekiel Davidson, an American, was placed in charge. He immediately purchased an American kiln, which resulted in 1905 in a production of 75,000 barrels, which was marketed at 25 shillings (\$6.08) a barrel. This Pretoria factory is to be increased threefold and other mills will be erected near Johannesburg and in the Orange River colony.

Plant for West Virginia.

MARTINSBURG, W. VA., January 7.—U. S. Marshall Charles D. Elliott and a party of Pittsburgh and Wheeling capitalists have purchased the Rutherford tract of limestone and shale land near this city for \$12,000.00. Work has been started to develop the property. A cement plant will be established and the rich limestone deposits will also be worked.

The Sandusky Portland Cement Co. has obtained options on marl beds of Lakes Deawat and Milford, in the vicinity of Goshen, Ind.

Benjamin White, former treasurer of the Warners Portland Cement Co., died at Syracuse, N. Y., December 24.

New Factory for California.

KANNET, CAL., January 4.—Chasta County will soon have a Portland cement factory to be located at Morley, four miles north of here. W. P. Hammon, who recently became the sole owner of the Alta Lime and Brick Co., has discovered a vast quantity of raw materials for the manufacture of Portland cement and will at once commence the erection of a plant. Among the improvements will be a five-mile electric tramway to the quarry from the factory. The Northern Electric will also build an electric road from Redding to the factory site, drawing also from the nearby mines for freight and passenger traffic.

Will Build at Dallas.

DALLAS, TEX., December 31.—The Iola Portland Cement Co., has abandoned the original intention to build a plant at Fort Worth, and instead, is building the new plant at Dallas. This will give the company two plants at Dallas. The first plant of 1,000 barrels daily capacity has been in successful operation there for several years. The new plant will have a daily capacity of 2,500 barrels and will be built directly across the road from the old one. Work has been going on for some time and the foundations are now in.

Retires as President.

CASTALIA, O., January 2.—W. J. Prentice has retired as President of the Castalia Portland Cement Co., after having served in that capacity for nine years. The following officers have been elected: G. W. Hackett, president and general manager; John S. Craig, vice president; J. J. Porter, treasurer; Charles L. Johnson, secretary and sales manager. The company is at present installing three kilns and will increase the capacity of the plant to 2,000 barrels daily.

Will Install New Equipment.

FORDWICK, VA., January 6.—The Virginia Portland Cement Co. will make extensive improvements and install equipment for an additional capacity of 2,000 barrels daily. It is also proposed to erect a new power-house, installing two turbines, increasing the boiler capacity by 11,500 horse-power. All of the machinery will be electrically driven. W. S. Barstow & Co., New York and Portland, Ore., are consulting engineers.

Cement Free of Duty.

Consul J. C. Caldwell, of San Jose, advises that by an executive decree of Costa Rica, cement, is to be free from import duties and wharfage dues after January 1, 1907. The free importation of cement will reduce the cost of construction of buildings and assist the industries which are starting up on a small scale of making cement brick, pipes, and building ornaments.

Will Increase Its Capacity.

BAY CITY, MICH., January 3.—The Herla Cement Co. has begun the installation of machinery and an additional plant to bring the capacity up to 2,000 barrels daily. Since the close of navigation the company has almost suspended operations at times in its shipping department owing to shortage of cars. It is hoped to have the plant running at its enlarged capacity early in the spring.

Plant Being Rapidly Completed.

MASON CITY, IOWA, January 7.—The mammoth plant of the Northwestern States Portland Cement Co. is rapidly approaching completion. The kilns, a number of which are on the ground, will be 110 feet long and 7½ feet in diameter. All the work is being rushed with the exception of laying the concrete. The plant is expected to be turning out Portland cement by June 1.

The El Cajon Portland Cement Co. has elected the following directors to serve for the year: W. E. Rogers, H. K. Loud, G. B. Loud, Thos. J. Hoyt, R. A. Richards, Jonathan Palmer, Jr., C. W. Rembeling, John McKenney. Operations on the plant of the company will be resumed in the spring.

Cement in India.

Consul-general W. H. Michael, of Calcutta, India, reports that a great deal of cement is used in India in building operations. Portland cement is considered the best and is used for all particular work. It is used in laying brick walls in foundations, and whenever wood is used for structural purposes it is laid in cement whenever possible. Floors, moldings, cornices and outside and inside trimmings are made of sand and cement. Wherever cement can be used to guard against vermin, especially white ants, it is freely used. Houses that have flat roofs are covered with brick dust and particles of brick mixed with cement and stamped down hard. Pitched roofs are covered with corrugated iron or tile and then solidly covered with cement and sand. These roofs last well and require little repair. Artificial stone is extensively manufactured and used in India for building purposes and for pavements and walks. Floors are laid in cement and made ornamental by embedding broken glass and china in figures in the body of the cement. The outsides of temples are made in the same way and are very attractive. The supplies of cement for India come mainly from the United States, the United Kingdom, Belgium and Germany. Inferior cement is not wanted, but the best cement is in good demand at good prices.

Experimenting With Dust Arrester.

STEWARTSVILLE, N. Y., January 11.—Work has been started at plant of the Edison Portland Cement Co., at New Village, to double the present capacity. Mr. Edison is now experimenting on an electrical dust arrester, which when completed, will save cement and also overcome the dust nuisance of which nearby farmers are complaining.

The Consolidated Cement Co., have shut down their Binnewater, N. J., plant for repairs but will start up in the spring.

The imports of cement in the United States for 11 months of 1906 were 773,000,000 pounds as against 307,000,000 in the same months of 1905.

Fire completely destroyed the powder house of the Northwestern States Portland Cement Co., at Mason City, Iowa. The dynamite burned up without exploding.

For the first time in three years the entire plant of the Atlas Cement Co., at Northampton, Pa., closed down for a day in order to give their employees a holiday over Christmas.

Following their regular custom, the Marquette Cement Manufacturing Co., at La Salle, Ill., distributed at Christmas time, \$5,000.00 in cash to its employees at the cement plant.

The Lehigh Portland Cement Co. will build a \$1,500,000.00 Portland cement mill in the neighborhood of Mason City, Iowa, having recently purchased 500 acres of land for that purpose.

The Hidalgo Cement Co., has been incorporated at Louisville, Ky., with a capital stock of \$30,000.00. The incorporators are: Attila Cox, J. B. Speed, Harry Weissinger, and George Gaulbert.

The Bath Portland Cement Co., will construct three new buildings for storing cement at Bath, Pa., one of which will be 69 x 69 ft. and two others 34 x 68 ft. each. The entire work will be concrete throughout.

The Lehigh Portland Cement Co. have acquired the entire property of the Mitchell Lime Co., at Mitchell, Ind., and will conduct the business as before, in addition to using the limestone for the manufacture of Lehigh cement.

Charles A. Matcham, general manager of the Lehigh Portland Cement Co., since its organization nine years ago, will resign February 1. Mr. Matcham was formerly connected with the Alpha Portland Cement Co., at Alpha, N. J.

W. E. Erdell, who has been general manager of the Whitehall Portland Cement Co. since May, 1901, resigned January 15, to take charge of the plant of the Penn-Allen Portland Cement Co., at Bath, Pa. Mr. Erdell is one of the pioneer manufacturers of this country, having started with the American Cement Co. in 1888.

A City Bedded in Cement.

Again we have received reports from Rome that the plan for excavating and scientifically exploring the ancient city of Herculaneum is nearing its realization, and that the almost unsurmountable difficulties which have stood in the way will soon be removed. It is a most gigantic undertaking, and if successful promises to throw a light of the most far-reaching importance upon our knowledge of classical antiquity.

One of the great difficulties which stands in the way is that the modern city of Resina lies exactly over the ancient city of Herculaneum. It is indeed often the case in making archaeological excavations that later structures have to be removed. But in Herculaneum the thing assumes great proportions. The mere fact that Resina is a city of 20,000 inhabitants is in itself a difficulty of no mean importance. But even greater difficulties are caused by the fact that Herculaneum lies not only much further below the present level than Pompeii, but that the mass of matter which covers it, although composed of the same materials as that which covers Pompeii, and ejected almost at the same time, is infinitely more difficult to remove.

When Vesuvius became active on the 24th of August in the year 79 A. D., a strong northwest wind drove the mass of brimstone and ashes in the form of a large black cloud toward and over Pompeii. The result was a heavy shower of brimstone which covered Pompeii and the surrounding districts to the depth of two or three yards with pieces of brimstone as large as pigeon eggs. After this fall came an equal quantity of ashes, and after the ashes and partly with it came floods of rain, which changed the top layer of ashes into a mass of mud, which later became hard and formed a firm crust over the whole.

The same masses of lapilli and ashes had but a few hours before buried Herculaneum, but they did not fall one after the other, but at the same time, and were accompanied with copious showers of rain. So much water fell that the lapilli and ashes which fell on the sides of the mountain became a stream of mud, which poured down the mountain over Herculaneum, and with the masses which fell in the city itself, covered the whole place twenty to thirty yards deep.

Herculaneum was therefore, buried deeper than Pompeii, but more important still is the fact that the lapilli and ashes were saturated with the water and formed a kind of mortar which, in the course of time, dried out, solidified, and became as hard as stone. Thus the whole city lies, as it were, imbedded in cement, and must be hewn out of the rock.

This is the chief difficulty which presents itself in exploring Herculaneum. And, indeed, it is of such gigantic proportions that there are some who seriously question whether the result of a systematic excavation of the ancient city would justify the great sacrifices it would involve, especially since Pompeii, which represents the same epoch, is so well known.

To the question of the large majority of archaeologists, who are always enthusiastic whenever there is a prospect of a new relic, answer in the most unequivocal terms: "Yes, yes; the results would more than justify the sacrifices of money and labor. Herculaneum owes science much information which it has withheld these nineteen centuries. The time has come to make it speak. And when it does speak it will tell us much which Pompeii has left us untold." In Pompeii Vesuvius did not do its work thoroughly enough. When after the 26th of August, 79, the earth became quieter and the fugitive inhabitants of the destroyed cities ventured to return to the neighborhood of Vesuvius to search out the ruins of their houses, Herculaneum had disappeared utterly from the face of the earth, but in Pompeii the higher parts of the houses stood out above the ashes and everybody was able to find his own house. It was comparatively easy to dig down some distance to remove the ashes and the light, porous brimstone beneath it, to break through the walls beneath the rooms, to hide what could be hidden, and to remove the valuables and other things which could still be used. Hence a house is rarely found in Pompeii which had not been ransacked immediately after the catastrophe.

In Herculaneum, on the other hand, such a general plundering was impossible. Everything remains just as it was after its destruction, so that here we shall get a very much larger collection of works of art, household utensils and other objects used in daily life.

Trophies of the Chase.

Now, Mr. W. H. Ford, the sales manager of the Kosmos Portland Cement Co., was born in aristocratic old Charleston and his relatives still live in the city which was once the pride as well as the namesake of England's merry monarch. The young gentleman in question has been a busy man, as his extensive circle of acquaintance throughout the entire South can testify, for he has carried the big "K" of the Kosmos brand into every city and important town in the South. Right merrily did he betake himself to the cars to spend the Christmas holidays amidst the scenes and among the companions of childhood. It is not the purpose of this story to tell the cordial welcome he found, or the mild beaming eyes that spoke joy at his coming, but rather to here set down another noble record he made in the land of enchantment that is known as the preserve of the world famous Otranto Club. Many readers of this have gone deer hunting before and had all the sport without bringing home the noble game, even like the balance of the party who went deer-stalking with Ford. Two trusty Senegambian retainers of the house of Ford followed Young Marse's footsteps into the dangerous defiles of primeval forests, where many a hunter has gone before, only to locate the traces where deer have been, and long are Otranto's records of the stampeding deer and hunter and with "buck ague." Not so with Ford, who never tasted defeat, for two handsome antlered bucks go down before his unerring aim. With a grand sweep of triumph, he passed the weapon to his sable squire, who exclaimed in high glee, "Many a time have I done it, Massa Ford, but there's nary a gemmen done it yet." Now the proof of all this can be established in Ford's office in Louisville, where the antlers are sacredly kept displayed on the wall, and was not our staff artist present to catch him in the act, with a snapshot, a reproduction of which is printed herewith.

Just a Bit Personal.

While the cement industry has seen some important changes in the personnel of several of the larger manufacturing companies, there is one branch that still retains its old reliable, and that is the pulverizing end. H. G. Kimble, the Apostle of the Kent Mill has many new things to tell in the way of the increase in orders for his mill, and also the fact that there is no mill like the Kent.

300,000 tons of cement rock were broken in a single blast at the quarries of the Alpha Portland Cement Co., Alpha, N. J., January 5. Two and a half tons of dynamite were used in three holes, their respective depth being 97, 90 and 86 feet. This is the largest blast made in the history of the company.

Cement Manufacturers Alive.

THE Portland cement manufacturers look upon the coming season as demanding practically 50,000,000 barrels of their output, and up to the present time they have never neglected a command of this kind. Even at this early date it can be confidently said that the cement manufacturer will take care of his corner of responsibilities of 1907, no matter what else may happen. There is no excitement, but calmly and deliberately they proceed to prepare for the rush by putting in extra kilns to increase their capacity, providing superior quarrying arrangements and all the minutiae of such an enormous undertaking that is required to handle such a large quantity of heavy materials, and the purchaser and consumer only knows that when he asks for the product that the goods are ready for delivery. Their perfect organization and up-to-date methods are really a pattern for other industries to emulate. With becoming conservatism for those engaged in such an important industry it is practically certain that no great fluctuation in the price of this indispensable commodity will be noted in 1907 to discommode the steady progress of the season's operations. It is just as safe to say that cement will not go out of sight or, rather, out of reach, as it is to say that the product will not be over-manufactured to any large extent, and thereby bring a slump in the midst of a busy season. There is probably more intelligence and consequently more foreknowledge and preparedness attributable to the manufacturers of Portland cement than in any other line.

American Elects Directors.

PHILADELPHIA, Pa., January 15.—At the annual meeting of the stockholders of the American Cement Co., of New Jersey, the following directors were elected: George W. Norris, Frank G. Thomson, J. H. Catherwood, J. W. Eckert, Robert K. Cassatt, Charles S. Farnum, Robert W. Lesley, and G. H. B. Martin. The company has increased the par value of its shares from \$10.00 to \$50.00 a share, to take effect March 1. The total net earnings of the company were \$420,183.44 in 1906, against \$208,815.00 in 1905, and \$492,144.00 in 1903.

Trying to Form Company.

SALT LAKE CITY, UTAH, January 12.—Dr. W. L. Ellerbeck, who, with T. R. Ellerbeck, owns considerable cement shale property in Tooele, are interested in the formation of a company for the erection of a Portland cement plant at this place.

The Vancouver Portland Cement Co., has been incorporated at Toronto, Ont., with a capital stock of \$1,500,000.00.



ANOTHER STORY OF FORD'S DEER HUNT.

For the Retailer.

The National Builders' Supply Association.

Meets Semi-Annually.

OFFICERS:

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St. Louis, Mo.	
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Official Organ, ROCK PRODUCTS.

Manufacturing as a Side Issue.

Many dealers in the large cities, in addition to handling the largest percentage of lime, cement and plaster in the town, often add lime kilns to their other business to get two profits out of the business, or because they can not get exactly what they want, or in some cases because they desire to increase their operations, being ambitious to be the largest operators in these lines. But one active operator said the other day, in relating an experience of once owning a cement mill, that he had his stomach full of outside operations, and that he found he could make more money and he was sure of what he made by sticking to his own last, that is handling material. There is a whole lot in this, but still as long as men have ambition there will always be operators who prefer to manufacture their own goods, and it is often the case that they find their calling and they are better manufacturers than they are dealers; but this gentleman's experience was sort of "buying a pig in a poke" and therefore he prefers to operate in his own line strictly.

Quick Trading.

A long slim pal of ours who makes his bread and butter by selling cement and lime and other supplies, in commenting on the year's business, said: "I have had a most satisfactory experience this year because of a mill connection I have in cement. In our city many contracts come up for quick delivery, and knowing that these must be delivered on time I have stated my case to the manufacturer and I find it satisfactory to call up this mill to-day and get my cement two days hence; because this manufacturer makes it his business to keep in his warehouse enough material to take care of this spot business and the result is that we have paid him a whole lot of money

that would have gone into the hands of our competitors if we had not been so hooked up with our mill connection. However, we make it a practice to always have about ten thousand barrels of cement in our warehouse because we think that is where we make our money by carrying in stock what our customers want and delivering it to them when they want it."

The Country Dealer.

The man who handles the most of the builders' supplies in the country town is the retail lumberman. When a man wanted a fence in times past it was the retail lumberman who furnished the No. 2 fencing and cedar posts. Cedar became scarce and No. 2 fencing higher, then it was wire, and now cement posts are sold where the dealer is wide-awake and pushing. Formerly it was a wooden water trough; now it is a cement water trough, thus demonstrating to the dealer the possibilities of an increase from one carload of cement a year to twenty-five or fifty.

We have noted in looking around among our good friends, the dealers, that they have not been as aggressive in pushing lime, plasters and cement as they have just old boards. We listen every now and then to Bill Jones whose slogan in his advertising is, "Anything you buy of Jones is the quality." That means if he handles a special brand of cement it is the best on the market; but experience has taught us, especially in this fast pace in which the business men want to go nowadays, that you have to reach the consumer with your material. You should satisfy the farmer that he can have better cows if he has a cement floor in his barn yard, and the farmer, by the way, has the money nowadays. It is a good thing to start off, even if you have to trim the corners of your cement price for a season, for farmers catch the spirit. They do not like to see a neighbor have something better than they, and this especially applies to the thrifty farmer and the dealer to make himself strong on the cement line, will do well to spend more of his energy in pushing these various lines.

Advertising Devices.

The retailer nowadays have many new tricks which catch the eye of the farmer as he drives into town. One effective device used by a friend of ours is a bulletin board giving the current prices of grain, potatoes, cattle, even butter and eggs. The watchmaker and the dry goods man has used the fence in the past largely; the builders' supply dealer can do likewise to good advantage, and if he does not use his home paper he is making a mistake. You may say you can't advertise cement because it is all alike, but the brand, if pounded into the system of the country customer, will stick, and if this customer buys a few barrels of cement, Lehigh, Vulcanite, Atlas, Red Ring, or Universal or any other brand will be the one he wants. It is better than any other, because he knows, because he has seen it on the fences, has seen the "ad" in the daily papers, and it is just like a special brand of harness oil, or the \$15.00 cart, that is advertised. He has it down fine. If the dealer in builders' supplies expects to increase the volume of business in lime, cement and plasters he can not do better than push his good thing along by telling his neighbors what he has.

Plenty of Shed Room.

It is the custom of banks to select as substantial a building as possible, even to the point of building one in order to impress the neighbors that this is a good place to keep their money. The same rule will apply with the builders' supply man in advertising his own wares. If you happen to live on section 9, range 10, and have the money in bank so you can make improvements or expect to sell some hogs to build cellar walls or make any improvements at the farm, and you don't have any special preference for the supply man in town you will likely go to the party who has the best looking establishment where his materials are properly housed, and his lumber piled in the yard neatly, his windows in the office clean, good, bright paint on his shed and office; in other words, an air of substantial business about the institution.

Of course the farmer has always been accused of wanting to buy cheap, and he is a pretty good buyer, don't forget that, but at the same time it is not always the price that the farmer is after.

After all, he really doesn't know very much difference between \$1.00 and \$1.25, if he is only going to buy two or three barrels of lime, providing the lime is what he wants, and will serve his purpose. Besides the loss of materials, through slacking lime or the caking of the cement will be eliminated practically, with a well built warehouse with a lime and cement department in it, and if the dealer is going to do much business he must carry a good stock and be in position to take care of his orders when he gets them.

Illinois Masons' Supply Meeting.

The first annual meeting of the Illinois Masons' Supply Association will be held in connection with the seventeenth annual meeting of the Illinois Retail Lumber Dealers' Association at the Lexington Hotel, Chicago, February 12, 13 and 14. To all who handle cement or other mason's supplies this meeting will be of great interest and value. February 14 will be known as Cement Day and the following tentative program has been prepared for that day:

Thursday, February 14, 1907, 10 a. m.

Address by President.

Report of Secretary.

Report of Treasurer.

Address, "The Benefits of Association Work," E. H. Diefenbaugh, editor of Rock Products.

Address, "Cement and Plaster, Their Constituents and Uses," a. S. W. Curtis, b. C. M. Rose, of the Garden City Sand Co.

Discussion.

2 p. m.

Address, Chas. L. Johnson, of the Castalia Cement Co., "The Evolution of the Cement Industry."

Discussion and quiz box.

Election of officers.

The officers of the Illinois Mason's Supply Association are: W. S. Harwood, W. S. Harwood & Bro., Bloomington, president; P. Vredenburg, Jr., P. Vredenburg Lumber Co., Springfield, vice president; Everitt W. Hogle, 1511 Manhattan Building, Chicago, secretary; C. O. Lewis, Terry & Lewis, Galesburg, treasurer. In writing concerning the coming meeting Secretary Hogle says:

"Arrangements have been made for a low rate of fare on the railroads belonging to both the Western and the Central Passenger Association from points in Illinois and also from St. Louis. These rates may be obtained by obtaining a certificate from the agent when you buy your ticket to Chicago and depositing it with the secretary as soon as you arrive. When one hundred of these have been turned in to the joint agent they will be returned to you certified and will be good for the return trip on payment of one-third the regular fare and twenty-five cents to the joint agent.

"Besides the program outlined above there will be two theater parties, one to the LaSalle Theater where "The Time, the Place and the Girl" is having such a successful run, and the second will be to McVicker's Theater where will be presented the play, "The Shepherd King." Those desiring seats reserved for them will kindly communicate with the secretary at as early a date as possible. We have been able to secure the special rate of \$1.00 per seat for the best seats at these performances providing we take a minimum of one hundred seats. Two very enjoyable evenings are assured, so send in for reservations at once, to the secretary, E. W. Hogle, 1511 Manhattan Bldg., Chicago."

Will Meet in May.

NEW HAVEN, CONN., January 15.—The directors of the Masons' Material Dealers' Association of Connecticut have named a committee to take up the freight conditions as pertaining to the lime and cement business throughout the State. The committee is composed of E. I. Atwater, of New Haven; H. R. Dubois of Bridgeport, and F. H. Johnston, of New Britain. The next annual meeting of the association will be held some time in May.

Purchase Steam Shovel.

FORT WAYNE, IND., January 10.—The Baltes Stone Co. has just closed a contract for a new 70-ton Marion steam shovel, shipment to be made February 1. They will use the shovel for loading blasted rock and also for stripping at their quarry at Montpelier, Ind.

Make Hay While the Sun Shines.

The Western farmer has been fortunate in that the crop conditions have been grand this year, and the country banks show the balance. The farmer has swelled the deposit account and this is a father to the thought that you, as a retail dealer in builders' supplies, during the winter months, should get together all the data in reference to hard wall plasters, and the plaster companies are very anxious to give it to you, and keep everlastingly drumming the out-of-town buyer with something about the products of the rock, that will make him an excellent and comfortable house or barn, or some building that will increase the use of lime, cement and plasters.

One of the most aggressive men of that character that we know of is A. F. Bloomer, of York, Neb. Every year about this time we have been getting his calendar. He started to send it in the year one. We know it was a short time after we arrived on the builders' supply list and when you get a letter from Bloomer it is chuck full of interesting things about the builders' material business. If we were a farmer and lived in his neighborhood we would just go out of our way to buy boards, or strips, or a few bags of cement, or anything in building supplies that we needed, for he is everlastingly keeping in touch with what is new and you are then not a slow walker but are up-to-date.

Advertising Brands.

We smoked a builder's supply man's cigar the other day while he told us of his experience in breaking down the prejudice of a naval officer as to a particular brand of cement which had been well advertised and it was so impressed on his mind, that, notwithstanding the report of the chemist that another brand that had been put in competition with the well advertised one, could not be used on the work. The dealer remarked that after a long and hard pull he succeeded in satisfying the gentleman that the brand he specified was all right and would stand up to specifications. But our dealer friend said "you can't discourage me in the advertising proposition, for if it wasn't for the publicity of certain brands they never would be used. Not that they are not good, but when the sales department got your business they do not seem to be very particular about keeping it. In that connection, I might just say that I hope the manufacturers, who sell me cement, plaster and lime and other building materials, will just take it to heart that any of them who do not advertise in Rock Products make a mistake, for we peruse the advertising columns of our favored paper as closely as we do the reading pages, and we are very glad to say that we have been benefited in that we have seen the advertising of some specialty that we could add to our line, and have done so, and have made money out of the goods. Besides a paper like Rock Products should be patronized because it is doing something for our trade all the time. I keep in my regular reference file the copies of the daily Rock Products which were published at the National Meeting, and if I want to know of the names of some particular cement concern, or any other, I find it as a ready reference.

"Speaking of the meeting, I fear that as an association we have made a mistake by lowering the dues, for I don't mind telling you that we would pay a \$100.00 a year just as readily as we would pay \$10.00, for I figure that the three or four days that we spend each year at that meeting are most productive of good. I exchange ideas with my brother supply men of other cities as to the methods of handling various classes of material, as to the best way to make collections, the easiest way to handle certain contracts, and many other matters in which we have common interest. Besides the social features of spending a few days with those in our line of business sharpen our business wit and particularly help us by increasing our acquaintance with manufacturers in various lines, as well as renewing those with heads of concerns whose goods we have handled in years past."

The Lawson & McMurray Co., of Sixteenth and Clinton Streets, Hoboken, N. J., has been incorporated to deal in builders' supplies. The capital stock is \$65,000.00 and the incorporators are: Edwin D. MacMurray, 296 Roseville Avenue; Jas. H. Elliott, 260 North Sixth Street, both of Newark, N. J.; and James J. Carmon, 1247 Bloomfield Street, Hoboken, N. J.

Campaign of Mason Material Dealers.

New York, January 15.—The Mason Material Dealers' Association of Connecticut, which was formed in 1905 to bring about a stability and proper equilibrium in the trade by inducing the manufacturer to place his product through the regular dealer and not directly to the consumer, has issued another appeal to that end in the form of a circular letter. It urges every manufacturer to give his individual attention to the association's work and recalls to their notice the information blanks left with or sent to them last year, which were to be filled out and mailed to the secretary every time occasion for their use arose. From the data contained in these blanks, the association hopes to follow the course and gauge the extent of the movement, and it strongly urges all recipients of them to fill them out, and forward them to headquarters. If any correspondent has no blanks left the assistant secretary will forward them on demand.

The circular states that during the past year the association has accomplished much good along the lines of its organization. Its first aim was to secure such a membership as would give it a standing and influence when it got ready to go ahead with business. As a result the following well known firms now make up its membership:

The H. M. Purdy Co., Bridgeport; The F. H. and A. H. Chappell Co., New London; The Cottrell Lumber Co., Mystic; Wesley Hollister, Manchester; The City Coal and Wood Co., New Britain; George W. Dean, Stamford; The Bronson Lumber and Coal Co., Torrington; George W. Hill, Rockville; L. O. & E. S. Davis, Middletown; The New Britain Lumber and Coal Co., New Britain; W. L. Damon, New Britain; The Watson & Jackson Corporation, Hartford; Saxton & Strong, Bristol; The H. C. Wooster Co., Essex; Joseph Brush, Greenwich; The Sellman & Godfrey Co., Bridgeport; Tiffany & Pickett, Winsted; Bishop & Lynes, Norwalk; J. C. Burwell, Winsted; The Broadbrook Lumber & Coal Co., Broadbrook; The Southington Lumber and Feed Co., Southington; Thompsonville Lumber Corporation, Thompsonville; Parsons Lumber and Hardware Co., Unionville; William Stinson, Windsor; The F. S. Bidwell Co., Windsor Locks; The W. J. Atwater Co., New Haven; G. W. Andrew, Naugatuck; Schmidt & Liefert, Danbury; D. B. Judd & Co., Bristol; G. A. Upham, Watertown; The Billings Sidewalk and Coal Co., Hartford; The Swift and Upson Lumber Co., New Britain; H. G. Jones, Deep River.

The circular says: "The officers have used every effort possible to promote a better understanding in the trade and to get the manufacturers and wholesalers to realize the unfair position taken by them in competing with their own customers for the trade of the contractors and consumers."

As soon as it felt itself strong enough it took up the question of associate membership with some of the manufacturers. The Whitehall Cement Co. was the first to join, followed soon after by the Alpha Cement Co. By this action these companies pledged themselves to stand by the association, to observe its constitution and laws and be bound thereby, and "incidentally" to do business with the dealers and let the consumer do the same.

Among others the Clinton Metallic Paint Co. has this to say: "We beg to say we are in sympathy with your views, and inquiry will develop the fact that our firm has always been one of the strongest in protecting the dealer. We have never approved of selling the contractor or consumer and have adhered to the policy strictly."

The same position is taken by the Consolidated Rosendale Co.; the New York Cement Co., and the N. E. Lime Co. These three companies have gone on record as anxious to help the association and have been of much assistance to it.

Since early in the spring a committee from this association has been in conference with like committees from the New Jersey, New York and Westchester Associations, with a view towards a general affiliation and at a meeting held in New York City September 28, an organization was completed and is in process of incorporation in New York State. The Interstate Association will consist of three representatives from each of the four associations, including Connecticut. President F. H. Johnston and Secretary W. C. Robinson and Director H. C. Goodfrey were elected to represent

the Connecticut Association. They seek the assistance of every manufacturer in Connecticut to help increase the main membership, in the Connecticut Association, and with that and the combined efforts of the friends in New York and New Jersey, practical results can be realized and much good can be done.

Each member in any one of the associations is a member in all the others for all practical purposes. With such a membership amplified as they hope to have it, they feel that success is assured, as with the enforcement of the rules which have been adopted by the several state associations, hardly any manufacturer or wholesaler would want to take issue with them. Members are requested to advise the president or secretary promptly of any trouble they may have in their locality, and the matter will be taken up at once through the parent association, and if necessary then through the Interstate Association.

During the winter regular and frequent meetings will be held and every one is invited to come himself, and is requested not to leave his association duties to his neighbor. And also let the manufacturer know you belong to the association. Use the little rubber stamp on your letters to him and let him know that whoever treats you fairly will receive fair treatment from you. Tell him that the watchword of this association is Reciprocity, and that all are soldiers of the common good.

Business the Best Ever.

CLEVELAND, OHIO, December 16.—John A. Kling, president of the Cleveland Builders Supply Co., reports business in that great city and in the territory reached by their shipments as on the boom in every sense of the word. This concern is one of the most extensive institutions that operate in the supply business, and are also manufacturers upon a large scale. They make their own cement, lime and brick and have five warehouses at convenient locations for delivery to various parts of the city. They handle more of the American Sewer Pipe Co.'s output, and at the same time more of the Buckeye brand of sewer pipe than any concern in Ohio, and pronounce the Sackett's Plaster Board as a winner wherever it was shown, as their business on this product is steadily increasing every month. They handle the lime manufactured by the Stowe Lime Co. at Youngstown, Ohio, exclusively. It takes more than 150 men who are expert warehousemen to handle their goods and 75 horses are fed at their stables, which are used to draw the delivery wagons in making city deliveries.

An Old Wisconsin House.

RACINE, WIS., December 6.—The Fox Lime and Stone Co., engaged in the builders supply business, is one of the oldest establishments in the city. Besides handling a full line of building supplies, they are largely engaged in the home supplying trade, as retailers of artesian water ice. This concern was established in 1879 and became an incorporated company in 1892 with the following officers: Conrad Fox, Sr., founder of the industry, president; John J. Fox, vice president, and Conrad Fox, Jr., secretary and treasurer. The company are manufacturers and dealers in building and crushed stone in all sizes and operate their own extensive quarries, producing the finest grade of stone found in Southern Wisconsin.

J. M. Thayer, of the firm of O. C. Thayer & Son, Fifteenth and Chestnut Streets, Erie, Pa., says they have had an exceptionally busy season with increasing activity in the building line. This concern is the old established house representing the supply business, and they carry a very full line of supplies. They are the local representatives of Atlas Portland cement, and supply their customers with plaster, lime and sewer pipe, including the structural tile of every description. Naturally the sand supply comes from Lake Erie, and this they handle as extensive jobbers to the concrete and contracting trades.

Sanders Johnson & Co., Shaw, La., had the misfortune to lose their warehouse by fire, November 30. It contained a large quantity of lime, cement and other material which they had collected for the construction of the water works and electric light plant. The loss is estimated at \$3,000.00, partially covered by insurance.

Frank Hunter

C. L. Mead

C. H. Doan

J. P. Carlile

S. S. McDowell

EIGHTH ANNUAL CONVENTION
National Builders Supply Association
 COLUMBUS, OHIO, FEB. 5-6-7 1907.

Fred. Salzgeber

J. F. Angell

R. Stanley Rhoads - Chairman -

ENTERTAINMENT COMMITTEE
of COLUMBUS DEALERS

Martin E. Murphy

Thos. T. Van Swarengen

Charles Frank

C. G. Jones

E. Wollenweber

W. M. Scott

F. Henry Angell

E. C. Kissinger

BUSH-KREBS CO. ENGRAVERS, N.Y.

ALL READY FOR COLUMBUS MEETING.

(Continued from Page 3.)

plies and cite as a feature of their business the enormous growth in the demand for Portland cement. Besides this line, they are also extensive operators in coal, supplying a large local trade.

Mr. E. C. Kissinger was born in Columbus and has been identified with the builders' supply business for 19 years. He enjoys the distinction of being a vice president of the National Builders' Supply Association, elected at Philadelphia one year ago. Mr. Kissinger presented an interesting paper at the Philadelphia convention upon the subject of "Car Service" which was one of the leading features of the convention, and which developed more information upon the subject of the rights of the shipper than possibly anything else that has gone into print. As a leading member of the Ohio Shippers' Association, he has brought out many good things of practical application to every man's operation who attends these conventions. No doubt he has something up his sleeve, for he is not one of the fellows who stands still. Besides his supply business, he is a coal operator upon an extensive scale.

Mr. S. S. McDowell, by no means an old man, still as the head of the Wassall Fire Brick Co., represents the oldest establishment in the city of Columbus handling a general line of builders' supplies. Mr. McDowell is an Ohio man by birth and moved to Columbus in 1872 and became connected with the supply business as early as 1876. He has built up an enviable reputation for the promptness of his delivery and the completeness of the stock that is kept constantly on hand.

Mr. W. M. Scott is manager of the Hayden Automatic Block Machine Co., the inventor of several machines of high merit for the manufacture of concrete building material, that are well known and profitably used in many sections of the country. Mr. Scott is an Ohio man, hailing from Gallia county, down on the Ohio river. He has been a foundryman and iron worker nearly all of his life and is a practical machine builder. He has been identified with the iron and foundry business of Columbus, with the leading concern for a number of years, and is one of Columbus' business men who has won his success point by point to the top.

Mr. Fred Salzgeber has been in the builders' supply business at Columbus for about eight years. He was born in the suburbs of Columbus about 41 years ago on a farm and has never resided outside of Franklin county. Besides the usual line of builders' supplies, Mr. Salzgeber is an extensive operator in coal and handles both lake and bank sand. The extent and scope of his operations has steadily grown and the season of 1906 was by long odds the largest his establishment ever experienced. He is a man of push and enterprise and deserves his position as a representative business man.

Mr. Thomas T. van Swearingen, vice-president and general manager of the South Side Lumber Co., is a young man of push and energy and his concern has recently come into prominence as dealers in builders' supplies. The up-to-date lumber man realizes that he must be in a position to supply all the requirements of the building public and in this respect the South Side Lumber Co. has taken a place in the front rank. Now Tom is still a society man and is unmarried despite his popularity and successful business career.

Mr. James P. Carlile, is an Englishman by birth, but came to America in his youth. He has been in the builders' supply business for about 15 years, handles a very complete line of cement, plaster, lime, fire-brick and fire clay goods of every description, besides sand from the lakes and from the closer sand banks. He has an established position in the community and his concern is doing a thriving business. Mr. Carlile has been a member of the National Association for years and is considered one of the "Old Guard" in the practical workings of the organization. He is a genial companion and is ever ready to extend a hearty welcome to the stranger in Columbus.

Mr. Ernest Woolenweber was born in Columbus and has lived in the city all his life. He became identified with the builders' supply business about two years ago and has built up a splendid trade in that time. He handles a full line of supplies and makes a specialty of his sand operations which he supplies from his own pit located south of the city on the T. & O. C. R. R. The demand for high grade pit sand has steadily grown in Columbus and its environments until the volume of business has induced Mr. Woolenweber to begin the equipment of a thoroughly up-to-date sand separating and washing plant upon his property, so as to facilitate the delivery of sand in commercial separations of that indispensable product. He is still a bachelor and one of the most popular young men of Columbus.

Mr. F. Henry Angell, of the pulverizing department of the Jeffrey Manufacturing Co., has for some years followed up the machinery business, devoting his special attention in the last few years to the well accepted swing hammer pulverizer, which is now made by the Jeffrey Manufacturing Co., the well known machinery and equipment company of Columbus. Mr. Angell already has a wide acquaintance in the supply business, for every manufacturer of lime, plaster and cement knows the good work of the Jeffrey pulverizing department.

Mr. Charles H. Doan is a specialist in the line of building brick and vitrified clay products, including the well known Nelsonville sewer pipe. He is the sales agent of the Athens Brick Co., and for years has been identified with this class of supplies at the Columbus market.

Mr. C. G. Jones is an enterprising young dealer who only came to Columbus about a year ago. His former home was in Marysville, Ohio, where for a period of eleven years he handled coal and building material as the principal operator in that market. Since coming to Columbus he has met with success and his operations are constantly growing in importance for the volume of his business is steadily increasing. His office and yards are located in the western part of the city, with good railroad connections, so that he is in a position to branch out and take on more business.

Mr. M. E. Murphy and Mr. C. L. Mead represent the Acme Paving Co., which concern is the leading establishment of the city of Columbus in the line of concrete contracting. They handle building supplies upon a large scale in conjunction with their manufacturing and contracting operations. Both are young men accustomed to making their ventures win and the growth of their operations to the leading position which they now occupy as street contractors, extensive manufacturers of concrete utilities and the supplying of materials for all classes of construction, is the best evidence that they have earned their enviable reputation by solid worth. They have been identified with commercial life in Columbus for a number of years and are well known and highly regarded in all quarters.

Beside these, there are three other concerns directly identified with the supply business in Columbus: The Hamilton-Parker Co., Jacob Rapp & Co. and O. A. Spear, representatives from whose concerns will no doubt take an active interest in the convention occasion.

Mr. Frank C. Ferris, who operates the Ferris Steam Mortar Works and Mr. Nelson Ruggles, who operates the Rock Plaster Manufacturing Co., are also interested parties in the supply line.

Mr. Warren B. Ferris is a specialist in the capacity of sales agent for marble mosaic interior finishing goods, face and common brick and ornamental commodities, while Mr. W. I. Taylor, of the Columbus Macadam Co., and G. S. Frambes, of the Allegheny Quarries, with Messrs. Shoemaker & Casparis, represent the crushed rock industry that is now considered to be a factor of the material business.

Mr. Harry F. Rausch, western sales agent of the Whitehall Portland Cement Co., has made his home in Columbus so long that he knows

every nook and corner of the town, and will certainly be on hand to assist the Entertainment Committee to take care of the crowd.

The Governor of the State of Ohio, the Mayor of the City of Columbus, the Board of Trade, representing the entire commercial interests of the city and the local organization of building supply dealers, all join in extending a hearty Columbus welcome (that means a whole lot), to every dealer in builders' supplies who is a member or who intends to join the National Association to be present at the great convention at the Southern Hotel, on February 6, 7 and 8.

Mr. Harry S. West, of Toledo, the secretary of the National Builders' Supply Association, will be on hand the day before the convention, and throughout the proceedings and will gladly furnish application blanks to those who desire to join the National Association and every dealer who is alive to his own interests and who desires to see his business grow with profit to himself and accommodation to his customer should make it a point to attend the convention. There is no economy in which a similar investment can be placed that will bring such splendid returns, and the best proof of this is to note the list of names composing the membership, who are easily the leading dealers and representative men in the localities where their activities are located. It is no longer a question with the dealer of whether he will or he won't accept the invitation of the Executive Committee of the National Association to become a member and help work out the best results in his own business, but it is up to the dealer to get into the great band of progress represented by the National Association. If he intends to stay in the business and make his livelihood out of furnishing supplies to the contractor and builder, or give up the gun to a wide-awake competitor who is enterprising enough to get together and learn how others have achieved great success.

Special Program for the Ladies.

The occasion of the Annual Convention of the National Builders' Supply Association, while distinctively a business proposition for the formulation of a definite campaign for the coming season's operations, is at the same time accompanied by a pleasant social feature, and the invitation of the National Association is extended no less to the wives and the daughters of the members, than to Mr. Dealer himself. The local committee has made a special program for the amusement and entertainment of the ladies during the hours when the association will be in executive session. A tour of the important state institutions and a visit to the beautiful Arlington Country Club are features that have been definitely decided upon, and it is likely that a reception or card party may yet be arranged for. At any rate it is certain that all who come to the convention will be made welcome and taken care of by Chairman Stanley Rhoads and his efficient committee upon a generous scale and with a good will that has the heart in it, which we American business people know so well how to appreciate.

The Tomkins Bros. Co., 74 Passaic Street, Newark, N. J., has been incorporated to deal in builders' supplies with a capital of \$225,000.00. Incorporators are George W. Tomkins, Ambrose Tomkins, and Brenton Tomkins.

Accepts New Position.

NEW ORLEANS, LA., January 13.—F. Roder Smith, formerly chief clerk at the Lukens Iron Works, has accepted the position of office manager of the New Orleans Roofing and Metal Works and has assumed charge. Mr. Smith's new position was created as the result of the establishment of the company's new plant and the enlarging of its business.

The Acolyte Roofing Co., of Passaic, N. J., has been incorporated with a capital stock of \$30,000.00 by Robt. Robinson, Samuel S. Robinson and Geo. E. Griswold.

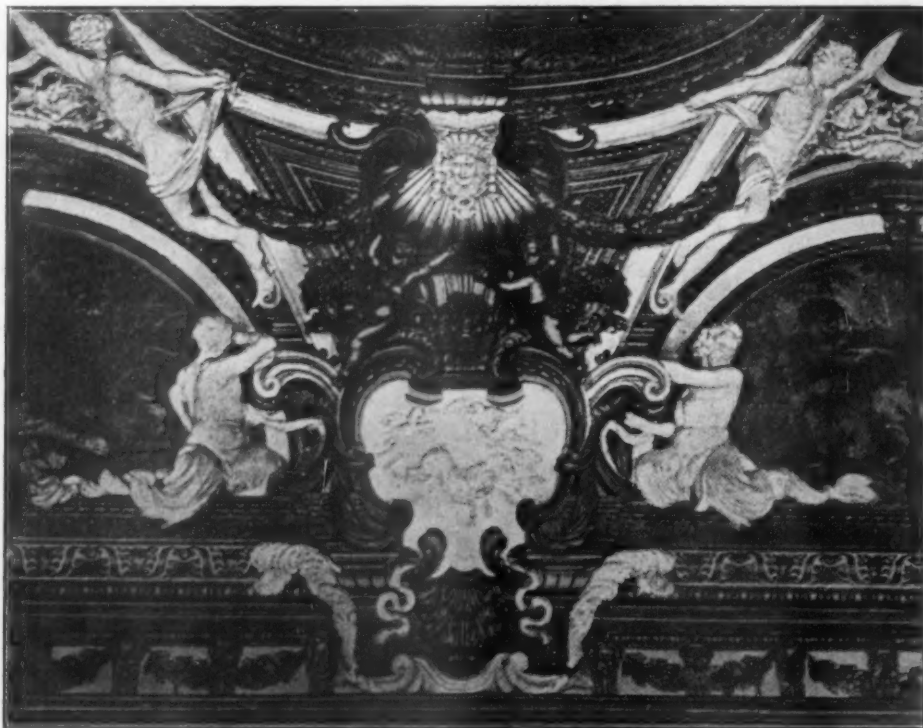
Plaster.

The Art of Plastering.

That the art of plastering is as old as civilization itself is patent to those who study the remains of the great buildings of the Egyptians, the Greeks, the Romans and other early nations. First starting with mud as a covering for their homes the earliest civilized nations soon found a more lasting and comfortable medium. Then plastering was used for its practical purposes, but when the Greeks, Egyptians and Romans had reached the higher points of their civilization plastering became not only a practical device, but an ornamental device. It became not only a craft, but also an art. We saw in the December 22 issue of Rock Products the high state of development that had been attained in the first century in Rome. We now come to discuss briefly the development of the art of plaster in the period of the Renaissance.

During the Middle Ages plastering retrograded. It lost its identity as an art and became again merely a craft. Sometimes it was used as a direct external protection from the weather, but rarely was it employed for ornamental purposes and its highest function was to prepare a surface to be painted on. But with the Renaissance, that prolific era, which we have called the birthday of the modern world and which was in reality a rebirth, as the name implies, of the literature, learning and arts of the ancients, the arts and crafts of the olden times were re-invented and the influence upon the imaginative minds of the people of the fifteenth and sixteenth centuries resulted in new inventions and a higher application of the arts than the world has ever known. Men in those days were looking for something new. And they went first to the old to discover the new. This was true with the art of plastering for we find that the great painter Raphael busied himself in learning the methods employed by the ancient Romans in decorating the walls of their magnificent palaces with plaster in order that he might be better able to pursue his own work in the decoration of the Vatican.

Even before Raphael's time there had been craftsmen, not yet worthy of the title of artists who had been speculating in the methods of ornamental plastering and had written books telling what they knew of the methods and giving recipes and directions for the work. But they were merely groping in the dark. They were searchers after a system rather than inventors of a system. The first step towards learning the art of plastering was the appointment of Raphael by Leo X as director and inspector of the search for the buried remains of ancient Rome. In 1518 Raphael determined to unearth the remains of the Golden House of Nero, which for five hundred years had been buried under their own decay. Not only did Raphael find painted chambers, but more cherished than all else abundance of modeled stucco decoration which had survived their long entombment with remarkable hardness and brilliant whiteness. This was most opportune for the decoration of the Loggia of the Vatican was then under consideration and Giovanni da Udine, Raphael's attendant, set himself to work to find out the process and the manipulation of plastering. In this Udine was aided by a translation of the work of Vitruvius, a Roman, who had been proficient in the production of splendid specimens of ornamental plastering. When Raphael died he left the completion of his decorative works to Giulio Romano and Gio. Francesco Penna, who associated themselves with Udine, who did the stucco or plaster work. Following the sack of Rome by the French in 1527 Udine went to Florence where he was employed by Cosimo de Medici and Michael Angelo. Although Udine returned to Rome in his old age, he founded a school in Florence, which produced great results.



STUCCO CEILING, SCALA DI GIOVE, FLORENCE, BY A. VASARI, 1569.

Vasari, whose work is shown in the illustration, was Udine's biographer and also his pupil, and there are many ceilings in this same palace, the Scala di Giove, with marvelous stucco work designed by Vasari and executed by the school Udine established. The illustration on this page is sufficient to indicate the high state of development the art of plastering had reached in the sixteenth century. Other illustrations will be published from time to time not only to show what the people of past ages were able to do but to spur on modern operation in plastering to a higher conception of their craft, a conception that will make it an art.

Leases Plaster Plant.

CHARLOTTE, N. C., January 15.—The Greensboro Wood Fibre Plaster Co. has leased its plaster manufacturing plant to W. E. Cockrane for a term of five years and he has assumed charge of the management of the plant.

Plaster Co. Elects Officers.

UTICA, N. Y., January 9.—The American Hard-wall Plaster Co. has elected the following directors: Thomas R. Proctor, J. R. Swann, F. G. Weaver, and J. L. Hughes. The directors elected the following officers: Thomas R. Proctor, president; J. R. Swann, vice president; F. G. Weaver, treasurer; J. L. Hughes, secretary, and E. E. Adams, assistant treasurer.

Patent Rights are Sold.

ST. JOSEPH, Mo., January 1.—The Kimmet Plaster Board Co., of this city, has sold the rights for the manufacture of Kimmet plaster board east of the Mississippi river to G. H. Lewis, of Bluffton, Ohio, for \$25,000.00 cash. Mr. Kimmet will use the money derived from the sale of the patent rights to put up a plant here for the manufacture of patent boards.

Big Plant at Winnipeg.

WINNEPEG, MAN., December 31.—The first gypsum plaster ever made in Winnipeg, has just been turned out by the Manitoba Gypsum Co. at their new works in St. James Street. There are only two deposits of gypsum known in Canada. One is in the east and the other is owned by this company on Lake Manitoba. The company first built works at Lake Manitoba but they were destroyed by fire last summer and the company decided to build in Winnipeg. About seventy men find employment in the plant and it is planned to operate the whole year.

King Plaster Co. Formed.

LANSING, MICH., January 17.—The King Plaster Co. has been organized here for the manufacture of a hard wall plaster by the election of the following officers: John Bohnet, president; E. C. Ewer, vice president; Leonard Seeley, secretary; and H. M. Rogers, treasurer. It is the purpose of the company to manufacture a brand of hard wall plasters which has been perfected by L. R. King, who will take charge of the plant and business. A factory has not yet been secured, but it is expected that one will be leased shortly and that the factory will be in operation within thirty days. The capacity of the mill will be forty tons daily.

Exhibitors at Minneapolis.

MINNEAPOLIS, MINN., January 18.—At the seventeenth annual convention of the Northwestern Lumber Dealers' Association held here January 15, 16 and 17 several prominent plaster manufacturing concerns in the Northwest had exhibits. The U. S. Gypsum Co., of Fort Dodge, Iowa, had a complete display of their large variety of plasters, plaster tile, and the famous Sackett Plaster Boards, which attracted much attention and seemed to have the approval of all. Those representing the company were: F. W. Tarrington, western sales manager; C. H. Newman, Minneapolis; W. P. McCormick, George C. Chambers, D. V. White, H. E. Randolph, F. Hogan, A. J. Cummings and H. C. Fields, assistant general manager.

The Iowa Hard Plaster Co., of Ft. Dodge, Iowa, also had a complete exhibit of their product and R. W. Merrill, general manager and secretary, said they were more than pleased with the convention and the business prospects for this year. J. B. Butler, president of the company and Walter Smith, one of the salesmen, were also present to tell the delegates to the convention about Iowa Hard Plaster and to see that every one got one of their beautiful leather pocketbooks which they gave away as souvenirs.

One of the most interesting exhibits was that of the Plymouth Gypsum Co., of Ft. Dodge, Iowa. This company expects to make a plaster board and have it on the market for the spring trade. They are also erecting a plant to make sewer pipe and expect to have it in operation in time to supply the fall trade. Those who represented the company at the convention were: L. E. Armstrong, president; F. M. Congill, J. F. Goulard, E. T. Kelly and M. M. Espy.

German Competition in Australia.

Here's a tip for American plaster manufacturers. According to the report of Special Agent Harry R. Burrill, of the United States consular service, who writes from Perth, Australia, German plaster manufacturers are underbidding American manufacturers in the Australian market. He says that while there were but two brands of plaster in Western Australia in former years, both imported from the United States, Germany has recently entered the field and is now selling what is regarded as an excellent quality of plaster at 2s. 4d. a barrel lower than the latest American quotation. Evidently it is "up to you," American manufacturers, to get busy and meet the competition. Read what Mr. Burrill writes and then make your plans to retain that trade for America. He says:

"Dealers were somewhat skeptical at first, doubting the ability of the German manufacturers to lay down at Fremantle a plaster that would compare favorably with the well known and popular American brands at 8s. (\$2.00) a barrel, but tests were made and the result was the immediate purchase by one firm of 500 barrels, and the permanent establishment of the German product on the market.

"In 1904 the price of American plaster was 7s. 9d. a barrel, landed at Fremantle, including cost, insurance, freight and exchange, with a sixty days' draft, which carries 2 1/2 per cent exchange, and it was at that time that practically a monopoly was established. Whatever the causes may have been the price has gradually risen to the present figures, and, while they are not regarded as unreasonable by the merchants here, they are still sufficiently high to permit of Germany entering the market at a considerably lower quotation.

"According to the importers of American plaster in Perth and Fremantle, the larger price demanded by the American manufacturer is undoubtedly due, in a measure at least, to the higher freight rates, but they are quite as positive in the declaration that, unless the American plaster can be held down here at as low or lower figure than the German product commands, its elimination, wholly or in part, from the market can not be avoided.

"Plaster is extensively used in Western Australia for walls and ceilings and the confidently predicted increase in the population of the state will for obvious reasons, carry with it increased demand for this commodity. Buildings are erected here as they are required, and not to any great extent for speculative purposes, therefore the outlook for a steadily expanding plaster market, assuming that the expected immigration to western Australia materializes, is encouraging. The arrival of settlers will, as is held here, stimulate the building industry in all directions and in every new structure plaster will be required. This is entirely aside from a steady regular demand, which in itself, constitutes a good business. The customs duty is 9d. per hundred-weight and the wharfage rates are 3s. 6d. per ton. Cartage and handling expenses generally cost about 1s. 6d. per ton."

Will Increase Plant's Capacity.

EL PASO, TEX., December 26.—One of the leading manufacturing interests of this city is the Arizona Gypsum Plaster Co., successors to the Douglass Cast Stone Co., with a capital of \$100,000.00. The officers are Mayor W. M. Adamson, president; C. O. Ellis, vice-president and treasurer; John O'Brien, secretary.

The business was established in 1903, and the company manufactures Litholite Cement Plaster, with a well equipped plant of 35 tons daily capacity, which will shortly be increased to 100 tons capacity. The company had already expended \$65,000.00 on the plant, and the necessary additions for enlarged capacity will require a further goodly expenditure.

Will Increase Capital Stock.

PARKERSBURG, W. VA., January 11.—The annual meeting of the stockholders of the National Plaster Co. was held recently and reports made by the officers show the concern to be in a satisfactory condition. The old board of directors was re-elected and the following officers were elected: S. T. Mallory, president; Thomas Gartlan, vice president; J. B. Arber, secretary and general manager. It was decided to increase the capital stock from \$15,000.00 to \$25,000.00 for the purpose of enlarging the factory and the establishment of a branch house at Charleston.

Iowa Hard Wall Plaster Co.

We reproduce herewith a likeness of R. W. Merrill, of Fort Dodge, Ia., secretary and general manager of the Iowa Hard Plaster Co. Mr. Merrill has been for the past eight years engaged in the retail lumber business, first with J. H. Queal & Co., of Minneapolis, Minn., and for six years manager at Fort Dodge of the Townsend & Merrill Co.'s interests.

Early in the spring of 1906 Mr. Merrill and his associates incorporated the Iowa Hard Plaster Co.,



it being their intention to build and equip a modern mill for the purpose of manufacturing plaster and other gypsum products. The company acquired 160 acres of land which borings had proved to contain the very choicest and purest of gypsum rock about three miles southeast of Fort Dodge.

On the first of October, last, ground was broken for the mill buildings and

the buildings are nearly completed, the heavy machinery installed, the mine producing from 75 to 100 tons of rock a day and prospects favorable for the manufacture of plaster on or before March 1.

The company spent several months investigating different kinds of machinery for plaster making with a view of obtaining the very best and they are confident that the time and energy so spent will be warranted in the grade of material they propose to place upon the market. The company is earnestly striving to make a plaster that will be "hard to beat but not hard to get."

The mill of the Iowa Hard Plaster Co. is located on the main line of the Illinois Central Railway between Chicago and Omaha and Sioux City and the company enjoys favorable switching connections with both the Chicago Great Western and the Minneapolis & St. Louis Railways, thereby making it possible to reach an extensive market.

The management of the Iowa Hard Plaster Co., in building its mill has sought to eliminate the obsolete and out of date features of other mills and having profited by noting their weak points are building with the idea of constructing a mill that when completed will be the most modern, most efficient, most convenient and most economical to operate in that district.

New Mill in Grand Rapids.

GRAND RAPIDS, MICH., January 14.—The American Land Plaster Co. has awarded the contract for a new mill to Charles Hoertz & Son. The mill will be one of the largest and finest ever built and will cost complete with equipment about \$100,000.00. A force of 100 men is at present at work sinking a shaft to supply rock for the mill, which will supply plaster chiefly for glass making purposes, the demand from that source being chiefly responsible for the present activity among the local plaster interests.

Hold Election of Officers.

STRACUSE, N. Y., January 16.—The following officers were elected at the annual meeting of the Paragon Plaster Co. yesterday: Jacob Amos, president; A. Nettleton, vice president; William K. Squiers, treasurer and manager; W. F. O'Connor, secretary.

Plasterers are being paid \$5.50 a day in Los Angeles, yet 50 of them have struck for an increase of 50 cents. The average daily wages for this work in San Francisco is \$7.00 and \$8.00.

The Indianapolis Mortar and Fuel Co., 13 Virginia Avenue, Indianapolis, Ind., are about to erect a hard wall plaster mill, and are in the market for the proper equipment for same.

Clay.

Three Conventions in St. Louis.

St. Louis will be the Mecca for members of the clay-working industries the first few days of the month of February. Three big conventions will be holding sessions in the World's Fair city at the same time. These are the National Brick Manufacturers' Association, the American Ceramic Society and the National Paving Brick Manufacturers' Association. The Ceramic Society will hold its meeting February 4, 5 and 6, in Parlor C, of the Planters' Hotel. The brick manufacturers will assemble February 6, 7 and 8 in the same hotel, and the paving brick men will hold their sessions February 5 and 6. Owing to the fact that these three associations are to hold their meetings at practically the same time it is anticipated that the attendance will be the largest in the history of the three associations.

St. Louis is a rapidly growing city and is one of the centers of the clay working industry. Contrary to predictions of pessimists the prosperity of the Mound City did not fall off after the great World's Fair, and to-day it is taking rapid strides in the direction of being the city of the West. In the prosperity which began with the Fair and has continued to date the clay working industries have had a large share; they helped create the prosperity and have profited by it. There are many plants of the clay-working industries in St. Louis and as several days will be spent in sight-seeing, those who attend the conventions will have an opportunity to learn something that they may be able to apply profitably to their own plant.

The Planters' Hotel offers special rates to delegates and, as in former years, reduced railroad rates have been granted on the certificate plan. Those paying full fare and taking a certificate will be sold return tickets at one-third the amount paid going, making a two-thirds rate for the round trip. These tickets will be good going from January 31 to February 6, inclusive, and will be good returning up to and including February 13.

As this is the first meeting the National Brick Manufacturers' Association has held west of the Mississippi river it is anticipated that many new members will be added to this organization. The other organizations are also expecting to increase the numbers in their fold. It is the duty of every member of the clay-working industries to attend the sessions of one of these conventions. He will not regret the time and money so spent.

United States' Potters Meet.

The twenty-eighth meeting of the United States Potters' Association was held in the Raleigh Hotel, Washington, December 4 and 5. An interesting session was held and some attractive exhibits were made. It was decided to transfer the exhibits to the Jamestown Exposition. The following officers were elected for the year: James Gass, Syracuse, New York, president; James C. Thompson, East Liverpool, Ohio, first vice president; Jas. Mayer, Beaver Falls, Pa., second vice president; H. A. Keffer, East Liverpool, Ohio, secretary; and G. S. Goodwin, East Liverpool, Ohio, treasurer. The executive committee is composed of William Burgess, of Trenton, chairman; Col. J. M. Taylor, of East Liverpool; Charles I. Franzine, of Wheeling, W. Va.; W. L. Smith, East Liverpool; C. H. Cook, Trenton; N. A. Frederick, C. C. Thompson, and H. A. McNichol, East Liverpool. The place for the next meeting was not chosen but it is probable that it will be held in Washington.

The Indiana Sewer Pipe Co., a new corporation represented by the Chicago Fire Brick Co., is preparing to erect a factory building at Mecca, Ind., at a cost of \$37,000.00. Equipment will cost \$50,000.00 or more.

The Clayworking School.

One of the most interesting addresses read at the meeting of the Canadian Clay Products' Manufacturers in Toronto in December was that by Prof. Edward Orton, of the Ohio State University, on "The Clayworking School—Its Need, Its Form, Its Function." Professor Orton summarized his discussion in the following eight points:

"1st. Clayworking has been shown to have a strictly scientific basis, in which engineering methods and chemical principles are of equal importance.

"2nd. It opens itself to the assistance of school methods and laboratory investigation as well as the other mineral industries, mining and metallurgy, which have long since received recognition in the curricula of engineering schools.

"3rd. It is not now using the aids of science in any large degree for the personnel of the present superintendents and owners of clay plants, includes relatively few technically educated men, and practically none who have had the training of a ceramic school.

"4th. Ceramic schools of high grade have been established elsewhere and have been in successful operation for ten years or more, and their graduates have won brilliant success in many industries and have shown their power to grasp and overcome the difficulties which they meet.

"5th. The ceramic graduate is not able, as he leaves school, to stand alone, and needs kind and encouraging treatment until he begins to acquire the poise which comes of experience.

"6th. If given this kind of treatment, a year or two makes him a useful and often an invaluable man—one whose horizon is wider and whose grasp is stronger than the product of any other kind of training.

"7th. The establishment of a technical school for clayworkers in Canada, especially if brought about by the influence of this body, should commit you one and all to a broad policy of publicity and the free interchange of data.

"8th. If, in order to make this school a success, you adopt this policy, you will soon find that the value of the school has become secondary to the broader advantages of freer intercourse and a more helpful spirit between manufacturers. In short, you Canadian clayworkers will find that in embracing the cause of science and education you have entertained an angel unawares."

Subjects That Need Attention.

In a letter to members of the American Ceramic Society Edward Orton, Jr., secretary, suggests the following subjects that need attention from manufacturers and members of the society and requests that contributions along that line be sent him:

"1. Data concerning unusual types of clays where the cause of any strange behavior has been proven by analysis or synthetic work. We always need more light on freak clays. Let us know how you get around the trouble with your particular freak.

"2. Geological papers, defining accurately the occurrence and area of clays not elsewhere described.

"3. Studies on the methods of preparation of clays for manufacture. We have almost no data on cost of filter pressing clays in quantity, or washing by any other process, or any other unusual treatment.

"4. Drying. It is a long while since we have had anything on any phase of this most common and all-important part of the clay workers' troubles.

"5. Scumming. Lovejoy's fine contribution has at last opened the way to some real tangible evidence. Anyone who has cured efflorescence in a clay of known composition where the scum-forming ingredients were accurately analyzed, owes to himself and to us to tell us how he did it, what he used and how much. Any one who tried and failed, after making such a study as above indicated, can do an equal service by letting us have his data.

"6. Burning. The problem that is always with us. How much coal does it take under accurately known condition? Kilns? Fuels? Controlling apparatus? There is literally no end to what we would like to hear on these lines.

"7. Body making. Glazing and coloring. We never get to the end of puzzles. Let us have your puzzle. Show how you worked it out."

Art Pottery vs. Practical Pottery.

There is something of a discussion under way in the American pottery trade at present as to the extent to which American pottery can ever supplant the European article, says a writer in the *New York Commercial*. American potters are accustomed to ask themselves occasionally why they can not make as good ware as their European competitors. They believe that they have raw materials that are just as good as can be found in Europe, and are never ready to admit that Europeans are the least bit ahead of them in skill and intelligence.

They seem to be, therefore, about to reach the conclusion that something is wrong with their methods or their manufacturing processes. They are quite disposed to admit that so far as beauty, finish and general artistic merit are concerned, a connoisseur would not prefer their goods to those from Europe. It is certainly true that that portion of the general public which insists upon having the nicest possible goods always asks first for something of foreign origin, and looks with some suspicion upon any home-made product, no matter how stoutly the merchant maintains that it is "just as good" as the article bearing the foreign stamp.

It is even said that some retailers who cater to the "best trade," do not regard it to their interest to carry a line of domestic goods, on the theory that it might tend to cheapen their entire assortment in the eyes of their customers.

According to the judgment of the trade, the fault of the American potters, if it may be regarded as a fault, is that they are more ambitious to establish a reputation for quantity of output than for quality. They like to do business on a big scale and are fascinated by big orders, and find it more profitable to cater to the general public with its immense demand for table ware and other forms of china, than to satisfy the passion of the four hundred for something extra nice.

In certain types of ornamental wares, America has little to fear even now from the competition of Europe. It is true that the bulk of these wares are produced under the name of "art pottery." The ware is made mainly for profit and art has little place in their conception or execution. The wares which truly merit the term "art" which are, in fact, individual works upon which much thought and care have been expended, are made in such relatively small quantity as to exercise but little effect upon the industry as a whole.

In the wares which depend for their success upon the skillful handling of large and intricate pieces there is, likewise, no foreign competition, as, for instance, bathtubs and laundry trays, railroad fittings, general sanitary wares and chemical stoneware. Hotel china is also an American specialty. There is no ware produced abroad which will endure hard usage so well as this so-called china.

These facts point to the conclusion that to a large extent technical knowledge and mechanical skill are well developed in some branches of the American ceramic industry, but that these talents are employed more for the production of goods for the masses than for the making of the finer stuff demanded by the "classes."

H. J. Klemme, of Clarion, Pa., will put in a brick and tile factory at Belmont at a cost of \$3,000.00.

The Chattanooga Sewer Pipe and Fire Brick Co., of Chattanooga, Tenn., was awarded the contract for furnishing the sewer pipe for the sewer system of Greenville, N. C. The system will cost about \$18,000.00.

The Eureka Fire Brick Co., of Norfolk, Va., has been incorporated by W. W. Sawyer, president; W. A. West, secretary and treasurer, and L. W. Doyle, vice president and general manager, all of Norfolk, with a capital stock of \$50,000.00.

Will Reopen Sand Bank.

MANSFIELD, O., January 17.—The Swisher sand bank, about two miles south of this city, which has not been in operation for ten years, will be reopened by the Swisher Sand Co. The following are officers of the company: D. H. Charles, president; Roy Swisher, secretary; Claude Schaeffer, vice president and general manager. Several varieties of sand are found in this bank and are said to be of first class quality for use in cement work, plastering and bricklaying.

Sand and Gravel.

Opportunity is Knocking.

Attention of dealers in sand and gravel is called to the report of the Committee of Tests of Cement and Cement Products read by E. S. Larned, chairman, before the Chicago convention of the National Cement Users' Association and published in this issue of *Rock Products*. Especially would they do well to read the specifications recommended for sand or the fine aggregate of concrete blocks and reinforced concrete. Read carefully the sentences: "Only clean, sharp and gritty sand, graduated in size from fine to coarse and free from impurities, can be depended upon for the best results. Soil, earth, clay and fine 'dead' sands are injurious to sand and at times extremely dangerous, particularly in dry or semi-wet mortars, and they also materially retard the hardening of the cement." This was the gist of the discussions at all the conventions of the cement users of the nation and different parts of the nation. Knowing that they must have sand in their operations, cement users demand that it must be clean and of the correct sizes, shape and surfaces.

It is a well known fact that notwithstanding the increase in the use of sand for building purposes since the introduction of concrete construction, the supply of first quality of sand has not been equal to the demand. Census reports show that the production of building sand for 1904 was 4,501,467 short tons against 10,127,750 short tons in 1905 and the official figures for 1906 will probably show a still greater increase. Here is the chance for sand men to feather their nests. They were unequal to the test in 1906, in some respects on a par with the railroad companies of our country. Will they take advantage of the increasing prosperity that is sure to come in 1907? Indications are that the present year will far outstrip 1906 in building operations and especially in concrete construction and it is up to the sand man to "get the grapes."

How can he do this? By installing up-to-date and sufficient machinery in his plant; by seeing that he has modern appliances for washing and drying; by seeing that when an order of sand leaves his plant it is just what the customer wants, that it is clean, sharp and properly screened. Of course all this will take time and money. New machinery will cost money, but the returns from the investment will be such that the sand man will be forced to open his eyes. Opportunity is knocking at the sand man's door. It is up to him to open it.

It is barely possible that dealers in sand and gravel do not realize the important part they are playing in the concrete industry. They, whose plants have been adequate for their business in 1906 probably realize the enormous business they can do in the building lines, but those whose plants are inadequate and whose product has been inferior probably do not realize it. They are the croakers. It is up to them to get busy. Now is the time during the winter months when your plant is shut down and when you are spending some of your time in day dreaming to prepare for the future. Don't overlook the opportunity. If you do the other fellow will "get the grapes."

Bank 17 Feet in Depth.

EAST GERMANTOWN, IND., January 2.—W. H. Kiser has completed his boring in the Pennsylvania gravel pit. The bed ranges in depth from 14 to 20 feet and it is thought it will average 17 feet. Instead of stone the drill came in contact with blue stone at the various depths.

The American Sand Co., of Columbus, has been incorporated with a capital stock of \$200,000.00 by E. C. Downard, C. S. M. Krum, F. A. Downard, Barton Griffith and W. B. Kiger. The company is an old established one, organized under the laws of West Virginia, and is taking out a new charter under the laws of Ohio.

Big Toledo Concern.

TOLEDO, O., January 15.—The Ohio and Michigan Sand and Gravel Co. was incorporated in November, 1905, with main offices here. They purchased the sand and gravel deposit of the Toledo Stone Sand and Gravel Co., located at Chilson, Mich., on the Ann Arbor Railroad. They remodeled the plant, putting in new engine, generator, pumps, screens, and an Allis-Chambers Crusher, at an expense of more than fifteen thousand dollars. This is the first motor driven sand and gravel washing plant in the country.

A volume of 500 gallons of water a minute is furnished by two stage turbine pump, motor driven, which is located at a lake 1,500 feet from the plant and has proven to be efficient and economical.

The plant has a capacity of 75 tons an hour and has been rushed with orders all season. Their high grade roofing gravel has been in demand far and near.

Along with other contracts, they have furnished 35,000 tons of sand and gravel to The Toledo Furnace Co., and 25,000 tons to the Toledo Ship Building Co. Both these plants are located on the of the Maumee River at Toledo. They were successful bidders on both these jobs against the river and lake sand men, and lime stone crushers. The car shortage has not affected them, owing to the fact, that they are on a north and south railroad. The officers of the company are: Charles Fox, president; F. J. Norris, general manager, and George E. Hardy, secretary-treasurer.

Sand Industry of Houston.

HOUSTON, TEX., January 2.—One of the most important industries of Houston is the sand business which brings thousands of dollars every month to the city. The sand is dredged from the mouth of the San Jacinto River and is brought to Houston on barges.

The demand for sand in Houston has according to good authority, increased at least 100 per cent during the past year, and is still on the increase. The sand comes from the San Jacinto River and is of the very best quality; in fact, it has been stated that it is the best quality of any sand that has ever been found in the Southwest. This sand possesses a peculiar value not found in other sands, and for that reason is in great demand in almost every section of the State where large building enterprises are in progress or contemplation. To meet this demand a vast quantity of sand is shipped out of Houston every day, and the demand is on the increase all the time.

Fine Pit in Alabama.

BESSEMER, ALA., January 14.—Foundry men who have inspected the sand pits of the Cottondale Sand Co., at Cottondale, say that they are the largest and best south of the Ohio River. The bed covers forty-five acres of land and contains building sand and sand suitable for molding and casting. The pits were opened a few months ago and the company has been pushed to fill the orders already booked. The officers of the company are: J. F. Gallagher, president; Fred Clark, vice president; J. D. O'Gara, secretary and treasurer.

Dan Goddrich, of Geneva, Neb., has leased a sand bank of Youngers & Co. and will open it up in the spring.

August Schmidt, a prominent sand dealer, residing at the foot of Lawrence Avenue, Chicago, was instantly killed by a south bound car in Chicago January 1.

The Barnes Sand & Gravel Co., of Portsmouth, Ohio, has been incorporated with a capital stock of \$20,000.00 by Charles S. Barnes, James W. Bannon, Henry C. Barnes, Henry W. Heer and Arthur W. Bannon.

The Terre Haute Sand and Gravel Co. has been incorporated at Terre Haute, Ind., with a capital stock of \$10,000.00. The directors are: Frank T. O'Hair, James H. Swango, James W. Thompson and Lee R. Witt.

The Fruitvale Gravel Co., of Fruitvale, Cal., has been incorporated with a capital stock of \$25,000.00, \$300.00 of which has been paid in. The incorporators are: J. C. Seulberger, W. Bilger and R. A. Jackson, all of Oakdale.

Side Talk.

Perhaps the most popular manufacturer selling belting to the heavy duty trade at the Chicago market is the Chicago Belting Co. The reason is plain, they take care of every order as if their reputation depended upon the smallest belt they furnish. Yet, nothing is too big for them to tackle when it comes to a driving belt. Recently, we had a little conversation with manager Ed H. Ball and Col. J. A. Shay, the widely known specialists whose combined efforts have made the name "Reliance" famous in belting; they told of a real big belt, perhaps, the largest on earth, which is running as the main drive in a big saw-mill out West, which has just been completed. This belt, an illustration of which is given herewith, is 7 feet wide and is made from pure oak bark tanned leather, three plies in thickness and is 114 feet long, showing a total weight of 2300 pounds. It required the centers of the hides of 225 steers to furnish the leather and each piece of this leather was separately stretched before being placed into the belt. In putting the belt together, no rivets, pegs or fasteners of any kind except the finest cement was used and the plies or layers were cemented together under hydraulic pressure of 250 tons. As no hide will produce a single piece of leather wide enough to make a belt of this width, it is necessary to use two or three centers to make up the width. These pieces are cemented together longitudinally with a 2-inch lap. This lap which was made entirely by hand is so nicely fitted together between the plies that the finished belt gives the appearance of having been made of a single piece of leather. Of course, the evenness of thickness and width and the "balance" of the belt were produced by the intelligent selection of the pieces of leather.



RELIANCE BELT, 7 FEET WIDE.

One of the most valuable contributions to concrete literature is entitled "Concrete Factories" published by Bruce and Banning, New York City, N. Y., and compiled and edited by Robt. W. Lealey, Associate American Society Civil Engineers. It is exhaustive and complete, covering the subject of reinforced concrete construction in its

entirety from every possible standpoint, including the translation and fully exemplified application of the French rules of reinforced concrete. It takes up the various systems of reinforcement, giving the claims and explanations of the inventors with liberal comment and deductions on the part of the compiler. It is embellished with many illustrations, not only of completed buildings, but of typical works in course of construction with diagram and exhibits explanatory of the text. It is all contained in a single column of small compass, but covers completely almost every point that the modern concrete engineer requires for the solution of problems most needed at the present time.

The Terre Haute Press Brick Co., Terre Haute, Ind., offers a big bargain in a brick yard to a practical man. This is one of the finest building towns in the country. The demand for brick has never been supplied during the spring months for the last five years, and the brick manufactured at this plant has always been sold at a handsome profit. The owners desire to sell to a practical man who can make good with the plant on easy terms, because they have other business interests that are growing at such a rapid rate that they are in no position to give the brick manufacturing its proper attention. Consequently, it will take little money to secure a good paying brick business.

We have just received a handsome and fully illustrated catalogue of cement workers' tools from the Kramer Bros. Foundry Co., Dayton, O. From the size of the catalogue and the variety of tools for the cement worker shown upon its pages, the claim they make of being the largest manufacturers in this class of tools in the United States seems to be verified. The catalogue will be sent to contractors or parties interested in securing such conveniences upon application.

The Allis-Chalmers Co., Milwaukee, Wis., announces the complete equipment of two more crushing establishments in the Southeast, which they have recently equipped with Gates' crushers, separating screens, etc. One is the Conway Quarry Co., Lochraven, Baltimore county, Md., which will produce commercial stone as well as railroad ballast. This concern contemplates the erection of large local storage facilities for Baltimore City deliveries. Massie & Pierce, Lynchburg, Va., located on the Southern R. R. will produce ballast and commercial stone.

"Listen to what others are going to do, then see what Hercules has done" was the text of a sign displayed in the Exhibition Hall at the recent Cement Users' Convention at Chicago. The Century Cement Machine Co., Rochester, N. Y., builders of the Hercules machine for the manufacture of concrete blocks, showed over 100 blocks of different sizes and designs built into two walls at the front and back of their space. This company report a heavy growing domestic trade, besides, a foreign business that is rapidly getting to be a valuable feature with them.

The crushing department of the Jeffrey Manufacturing Co., Columbus, Ohio, is not only prepared to take care of the crushing proposition in all of its phases with their swing hammer pulverizer, but every part of the crushing plant is provided for, including Patnoe chain elevators which have proven to be satisfactory and profitable wherever they have been installed, besides, separating screens, lifting and elevating devices to complete the crusher plant as well as to take care of the work at the sand bank in the new industry fast coming to be known as the sand plant where sand is separated, washed, dried and re-ground and thus made into a commercial commodity.

The Arthur Koppel Co., New York, Chicago, and Pittsburg, the well known manufacturers and contractors of industrial railways for every purpose have complimented their friends and patrons with a handy little pocket diary which is both acceptable and useful and acts as a constant reminder of this firm that manufactures every variety of industrial cars including portable tracks, turn-tables and switches which are such an indispensable factor in the equipment of every plant in modern times.

Make the Eclipse Machine

The Western Iron and Foundry Co., Wichita, Kan., manufacture a machine known as the Eclipse. It will make solid or hollow concrete blocks 18 inches long from 4 inches to 12 inches wide, both plain ends or mortar lock ends. It will also make angle blocks of various degrees, both inside and outside angles. Fractional blocks from 2 inches to 16 inches in length can also be made, and it is so arranged that one can use the full length of box for fractional blocks. It will make porch pier blocks, and by tilting the face plate lengthwise it will make tri-angular blocks with additional back wall and tri-angular cores. It will make a two-piece wall block that can be varied to be rectangular or have an acute or obtuse angle. Four styles of the machine are made, designed to meet the different demands of the trade.

"Sackett Plaster Board" is regarded so highly by the user who is delivered from all the troubles and waste of material occasioned by the employment of old time wooden lathe that the dealer who makes a specialty of pushing it finds gratifying returns in his profit account. The board is supplied in large sheets and can be nailed to the studding of side walls or to joists for ceiling work. Its use lessens the time needed in the process of completing the plaster work, and the house is ready for occupancy almost the instant the work is completed. There is no long period waiting for the plaster to dry out before putting on the finishing coat, for the skin or top dressing can be applied directly to the plaster board. Read what they have to say upon another page. They growing list of satisfied users are their best promoters.

The Illinois Supply and Construction Co., Colonial Security Building, St. Louis, Mo., builders of the celebrated "Garth" line of power and hand mold brick presses have recently added to their complete line of clay brick presses, a machine especially designed for the uses of the sand-lime brick industry. They invite the inspection and investigation of brick makers to the presses they build as well as their system for the complete equipment of brick manufacturing plants of every description.

The General Fire Proofing Co., Youngstown, Ohio, has begun an active educational campaign to promote the use of cement siding for buildings where metal lathe and studding are used for the construction of concrete exteriors plastered on the lathe and finished with smooth troweling or pebble dashed effects. It is the branch of concrete construction which is most economical and they claim it has not received anything like the amount of attention that it deserves.

The J. R. Alsing Co., 136 Liberty Street, New York City, congratulate themselves on being awarded a large contract with the following expression: "We have been given preference over more than twenty competitors for the complete equipment of the plant of the Texas Fullers Earth Co., of Dallas, Texas, for dryers, crushers, pulverizers and all concomitant machinery. The first shipment of this machinery has already gone forward."

If you are a manufacturer of sand-lime brick or interested in the development of sand-lime products, you want to send for the new booklet recently issued by the American Sand-Lime Brick Co., in the Great Northern Building, Chicago, Ill. It is entitled "Users of Sand-Lime Brick." It contains a whole lot of educational matter of small compass and this in connection with John J. Maroney's advice, is money in your pocket.

The Morgan Construction Co., Worcester, Mass., have a gas producer especially designed for the attention of the lime manufacturer who uses coal, that is worthy of consideration, because, of the fuel equipment which it inaugurates at the plants where it is used. They will take pleasure in giving full details to the enquirer.

The United States Gypsum Co. invited the attention of the dealers and plaster contractors to "Universal," their own plaster product which they claim to be a sensation wherever it is understood. They will be glad to tell you all about it.

W. S. Tyler Co., Cleveland, Ohio, have an interesting booklet upon the subject of "Screens." They manufacture a line of wire cloth from 4 inch mesh to 200 mesh.

The Cleveland Car Co., West Park, Ohio, say that they will be glad to furnish estimates upon industrial cars for all purposes as well as turn tables, portable tracks, switches and the like for the complete equipment of industrial railways.

The Arthur Koppel Co. announce that they have removed their Chicago office, which will hereafter be located at No. 1639-1641 Monadnock Block, where they will be glad to see quarrymen and contractors who are interested in their extensive line of steel dump cars and quarry transportation supplies in the shape of rails, turn-tables, portable tracks, etc. The New York office of the company is No. 66 Broad Street, and the Pittsburg office, 225 Fourth Avenue.

Wanted and For Sale

One insertion, 25c a line; Two insertions, 50c a line; Three consecutive insertions with no change in the composition, 50c a line. Count eight words to a line; add two lines for a head.

WANTED—HELP.

A MACHINIST who has had experience around rock crushing machinery; salary \$150.00 per month. References required with application. Correspond with E. B. & A. L. STONE CO., 900 Broadway, Oakland, California.

FOREMAN for a Sand-Lime Brick Plant. Must be a practical mechanic, familiar with brick and concrete building. Good salary to right man. Plant runs throughout the year. Send references. Address A 4, care Rock Products.

MANAGER to take charge of large lime plant in Virginia. Address Y 2, care Rock Products.

SALES MANAGER for plant, fifteen hundred barrels capacity; one familiar and acquainted with Middle West Territory. State experience and salary expected. Address KANSAS CITY PORTLAND CEMENT CO., Kansas City, Mo.

STONE CRUSHING PLANT, located in middle Atlantic States, want a man competent to manage same. Good opportunity to the right man. State salary wanted, experience and full particulars. Address W. J. VETTER, 220 Bleecker Street, Brooklyn, N. Y.

SUPERINTENDENT for a crushing and screening plant near Duluth; must be a mechanic and able to handle twenty men. Steady job to right man. Address NORTH SHORE ABRASIVE CO., Duluth, Minn.

SUPERINTENDENT who has had experience in the management of large rock crushing plants. Salary, \$175.00 per month and board. References required with application. Correspond with E. B. & A. L. STONE CO., 900 Broadway, Oakland, California.

WANTED—POSITION.

AS FOREMAN or Superintendent of ballast quarry; have had twenty years' experience. Am perfectly familiar with gyratory crushers and all machinery necessary for operating ballast plants. Best of references. Address Y 16, care of Rock Products.

AS SUPERINTENDENT or general foreman of crushed stone quarry, capable of handling steam shovels and crushers. Sober, and have had 7 years' experience in that kind of work. Address A 2, care Rock Products.

AS SUPERINTENDENT or General Manager, by an experienced operator in the manufacture of Portland cement. Reference furnished. Write Y 1, care Rock Products.

WANTED—MACHINERY.

A SECOND-HAND Power Mixer with gasoline engine. WINCHESTER CONCRETE CONSTRUCTION CO., Winchester, Ky.

FOR SALE—MACHINERY.

AT A BARGAIN—Three simplicity concrete block machines, one standard Sand and Machinery Co. mixer; one dry mixer with elevator, block tongs, fixtures, etc. Will sell as a whole or part. A good chance for any one desiring to enter the concrete block business. Good reasons for selling. CHAS. L. McNUTT, Manager, 114 Poplar Street, Jackson, Tenn.

CHEAP—1 Standard cement brick machine (40 mold).

One Standard concrete mixer.

1,312 brick holders, belts, shaftings, hangers and pulleys.

This machine is as good as new, has only made 50,000 brick. Inquire of H. HOUGHTON, Detroit, Mich.

GATES No. 4 Gyratory Rock Crusher in good order; also engines and boilers. Address R. P., Box 2, Station A, Cincinnati, Ohio.

ROCK CRUSHER, ENGINE, BOILER, etc., situated at Rockview, on the Cotton Belt R. R., in Scott county, Mo. Apply to MR. CHAS. BLATTNER, or Sturdivant Bank, Cape Girardeau, Mo.

SEVEN SECOND-HANDED Horizontal Sturtevant Mills 42 in. in diameter. Address NEWAYGO PORTLAND CEMENT CO., Michigan Trust Building, Grand Rapids, Mich.

SMITH TUBE MILL SHELLS, three with silix lining, 4x16 feet. All in A-1 condition. We offer the above for sale on account of rearrangement of our grinding department. ALMA CEMENT CO., Wellston, O.

THREE TUBE MILLS—Owing to changes in our mill room, we will have for sale three "Krupp" Silix lined tube mills, 5x22 feet. Can make shipment about December 15, February 1, and March 15, respectively. Make best offer. NORTHAMPTON PORTLAND CEMENT CO., Stockertown, Pa.

1,000 FEET 16-pound steel rails.

1 set Allis-Chalmers 10x30 crushing rolls.

1 Austin No. 3 jaw crusher and elevator.

1 Atlas 42x12 boiler.

1 D 24 Sergeant steam drill.

1 6-ton wagon.

Also derrick irons, car wheels, cars, etc. THE D. C. STATLER CO., Piqua, Ohio.

ONE ALBERT RAYMOND three roller inverted mill with vacuum separator attached, including blower complete. Never been used except to test the pulverizer. ST. LAWRENCE FILLER CO., Massena, N. Y.

FOR SALE—PLANTS.

ALABAMA LIMEWORKS, operated daily, including 500 acres limestone and timber lands. LOUISIANA BUSINESS CO., New Orleans, La.

CHEAP—An established business in a live town, manufacture sand and gravel brick. Capacity 1,200 M. Address E. G. KEMPER, Dallas, Tex.

CEMENT FACTORY, location in Iowa, close to good distributing point. All materials necessary for the manufacture of Portland cement in abundance. Address Y 3, care Rock Products.

FLINT CRUSHING PLANT near LaFayette, Ind. Nothing like it in the country. Other business takes my time. EDWARD HELY, Cape Girardeau, Mo.

LIMESTONE QUARRY or will lease, owing to ill health. Railroad through property. Fine opportunity for operations in Montana. Address J. E. WILLIAMS, Great Falls, Mont.

ONE LIME KILN 40 ft. high; 30 feet encased in sheet steel, bolted together with patented funnel shaped bosh, discharging from center of kiln.

1 Jeffrey crusher; 1 Jeffrey stone elevator, used for conveying shells to top of kiln about 75 feet long.

1 swinging derrick with 30 ft. boom and 8 h. p. hoisting engine and two revolving discharge buckets.

1 belt conveyor 6 in. cups; 1 belt conveyor 8 in. cups; 1 75 h. p. engine; 1 75 h. p. boiler; 1 revolving screen; 8 sheet iron cars on wheels for hydrating lime. Two O'Connell patented boilers for lime kiln used in furnace to generate steam for artificial draft and 4 blowers with same. All the above is in good condition. LOUISIANA LIME CO., Hennen Bldg., New Orleans, La.

FOR SALE—PLANT.

MONEY MAKING Soft Mud Brick Yard. Great opportunity for a practical man. Good profit and can not supply demand; 30 thousand capacity. Will sell at a bargain on easy terms as owner has large interests. Write at once. **TERRE HAUTE P. BRICK CO., Terre Haute, Ind.**

WOOD FIBRE PLANT for the manufacture of wood fibre and other wall plaster, two up-to-date lime kilns, a complete Clyde system for hydrating lime, all new, a good business established in the best city in the South. Address, **AMERICAN WOOD FIBRE PLASTER CO., Box 267, Birmingham, Ala.**

BUSINESS OPPORTUNITIES.

PARTNER wanted with \$5,000.00 cash, to take interest in concrete block business, having over \$20,000.00 in actual orders now on the books; completely equipped plant with sidetracks from two railroads and very complete equipment throughout. The same plant earned 200 per cent in 1906 upon a total capitalization of \$5,000.00. More capital and an active partner needed to expand the business; possibilities practically unlimited. The blocks of this plant have already been accepted by all local building authorities, and for six months the concern has been steadily turning away orders. Talk quick if you have the money and will appreciate an opportunity in the concrete industry where your capital can be doubled in one year and salary besides. Address Y 6, care Rock Products.

BUSINESS OPPORTUNITIES.

GOOD RELIABLE PARTIES to establish a cement factory; good inducements will be offered to reliable parties. Address, **J. W. SANFORD, Chamberlain, S. D.**

FOR SALE—MATERIAL.

CRUSHED GRANITE makes the best stone for concrete work. We have a few cars for sale; immediate shipment. Address A 5, care Rock Products.

FOR SALE—MISCELLANEOUS.

STOCK—A limited number of shares of stock in the fireproof Penetrable Brick Co., is now for sale, par value \$5.00, non-assessable. We will manufacture building block, brick partitions and floor tile, sewer pipe, fence posts, railroad ties, piling, telephone and street railway poles, cattle guards, timber for shafts and tunnels, mine props, doors and window frames, sashes, etc. All made from slag concrete.

The penetrable brick, railroad ties and fence posts allows a spike, nail or staple to be driven in the same as wood. This is one of the greatest inventions of the age, and will give big returns for money invested. Open only a short time. Address **W. J. SHELDON, President, Fireproof Penetrable Brick Co., 507 Locust Street, McKeesport, Pa.**

NOTICE!

As a basis for assessing damages in our infringement suit against N. F. Palmer, which, by a recent decision, has been referred to a master for an accounting, we wish to learn the location of every machine made up to this date, and we will pay a reward of \$5.00 for each and every name of purchaser or user of any kind of machine made by Noyes F. Palmer in excess of his sworn statement October 3, which is three, the names of which we have. **HARMON S. PALMER CO., 1450 Girard St., Washington, D. C.**

Clay Working Machinery

Yard Supplies of all Kinds



Steam or Animal Power Brick Machinery

**CEMENT MIXERS
ELEVATORS
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DRY PANS
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"MARTIN"
DRAWER 887
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EXCEPTIONAL QUARRY OPENING.

A limestone property in Southwest Missouri is for sale. Height of ledge 30 feet, and at least 800 feet long, opened up to some extent, and the quality of limestone guaranteed to be very superior. Located adjoining a town of 3,000 along the lines of the



Local stock subscriptions probably would be forthcoming to aid reliable party. This proposition will bear close investigation.

Send for new book, "Opportunities," and other industrial literature regarding numerous other quarrying locations along the Rock Island-Frisco lines.

M. SCHULTER, Industrial Commissioner,

1144 Frisco Building.

Rock Island-Frisco Lines, ST. LOUIS, MO.

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For Reinforced Concrete Construction.



IMMEDIATE SHIPMENT. ALL SIZES IN STOCK.

No charge for cutting to required lengths.

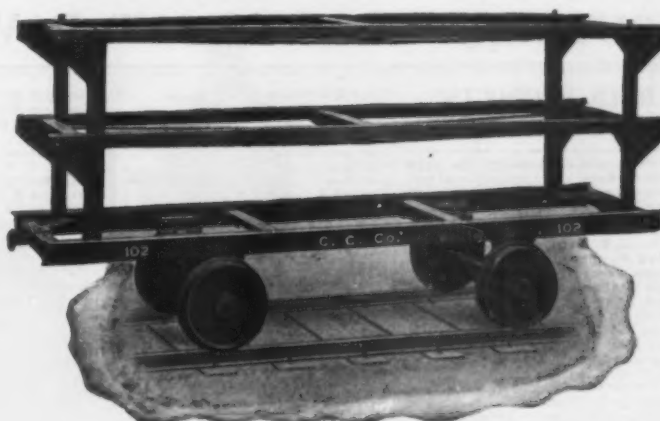
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Estimates Furnished upon Application.

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CLEVELAND, OHIO.

Tiger Brand White Rock Finish the best known and smoothest working Hydrated Lime manufactured.

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CORE DRILLING FOR QUARRY AND MINERAL PROPERTY.

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THE CAPPON PROCESS (SALGIUM CHLORIDE SYSTEM) FOR MAKING

Hard Plaster, Artificial Stone and Marble, Etc.
Without the use of gypsum, is of
interest to all lime manufacturers
THOMAS W. CAPPON, Patentee,
No. 801 E. 141 Street, NEW YORK.

Use WONDER ROCK DRILLS



No. 1 Wonder Drill.

And Let Others WORRY While YOU DRILL ROCK RAPIDLY, EASILY and ECONOMICALLY. The WONDER Water Drill overcomes the Dust Problem. Every Machine Guaranteed. Write for Catalog.

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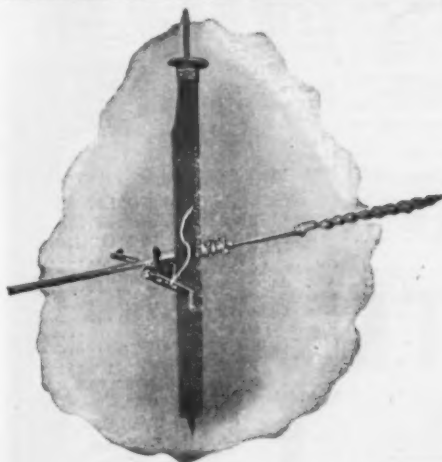
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TURN MILLS.

Allis-Chalmers Co.
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WIRE ROPE.

Macomber & White Rope Co.
Steam Stone Cutter Co.

NODAM-PWALL

The Cheapest and Best Waterproofing

Nodam-Pwall—A Fluid Compound has been invented, perfected, tried and found not wanting. When employed to subdue the affinity of seasoned cement brick or block and lime sand brick, to not absorb, but shed RAIN WATER.

Why Not Make a Profit

By Producing a Perfectly
Satisfactory Waterproofing

Compound for your
own Work



This formula now offered for sale for the first time is worth the investigation of all those who want to manufacture the best product at the lowest cost.

EVERY cement user, cement block and brick manufacturer and user, sand lime and brick manufacturer and user, and contractor will profit by purchasing this formula. The Price is \$5.00, which must be paid in advance and the signature of the recipient which guarantees the lawful owner of this NODAM-PWALL formula must sign a contract not to reveal the materials used or the mix which composes the formula, or the instructions as to its particular use.

NODAM-PWALL is a winner. It will make you money. The investment is small and by integrity of purpose and the purchase and use of the same you can add to your success for 1907 by SENDING YOUR ORDER AT ONCE, and don't forget the name NODAM-PWALL.

THE ROESLING CO.

233 FIFTH,
LOUISVILLE, KY.

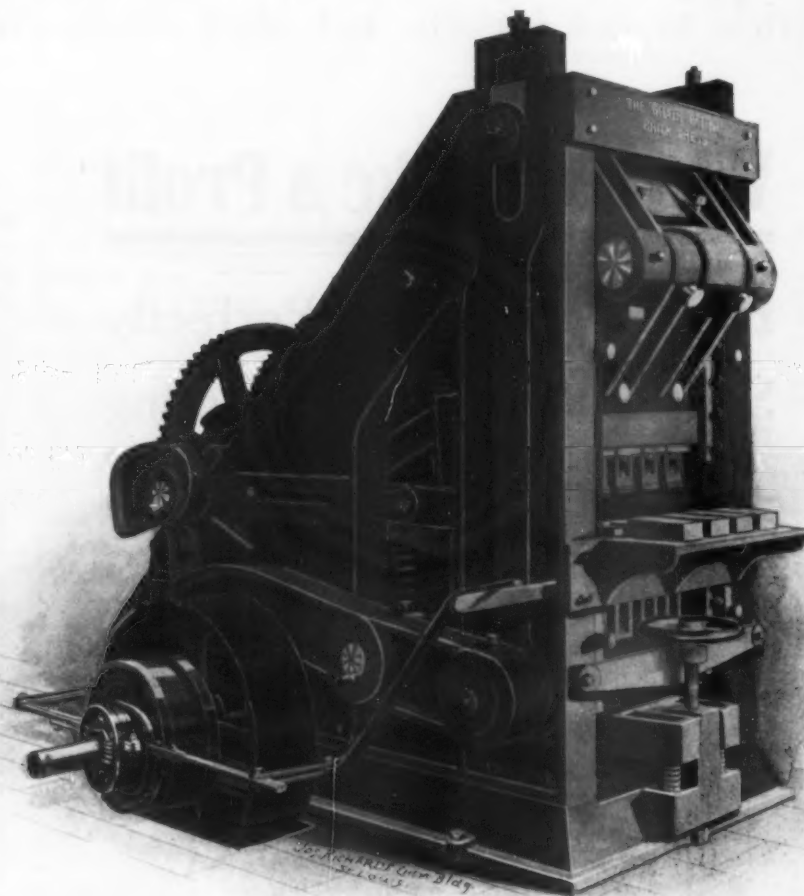
UNPROTECTED
BLOCK

NODAM-PWALL

The Grath Four Mould Special Brick Press

For Sand-Lime Brick of Highest Grade,
also for Highest Grade Dry Press Brick.

Built in
Two, Three
Four and Five
Mould Sizes



Only Press
Built on Cor-
rect Principles,
Only
Modern Press



Simplest and Best as Well as most Powerful Brick Press ever built. Guaranteed to make better brick than any other Press and to give complete satisfaction. Guaranteed against breakage. **Only Press Free from Side and Cross Breaking Strain.** Impossible to strain or twist crank shaft. ∴ ∴ ∴

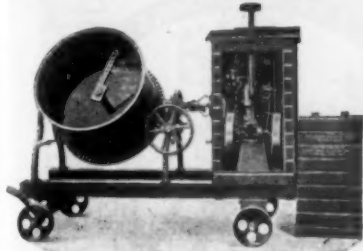
FOR PRICES AND PARTICULARS, APPLY TO

Illinois Supply and Construction Company

Suite: 512 and 513 Colonial Security Building

ST. LOUIS, MO.

Standard Concrete Machinery



Portable Power Outfits \$270 to \$470, according to size and equipment.

The **STANDARD CEMENT BRICK MACHINE** is the fastest hand brick machine on the market. It will make plain, veneered and ornamental face and shape, all perfect, smooth brick, true to size and design.

The **STANDARD CONCRETE MIXER** handles wet or dry mix, requires little power to operate, mixes batch perfectly in one minute, self-cleaning, easily charged and dumped.

The **STANDARD GAS AND GASOLINE ENGINE** is made in all sizes. Especially adapted to running concrete machinery.

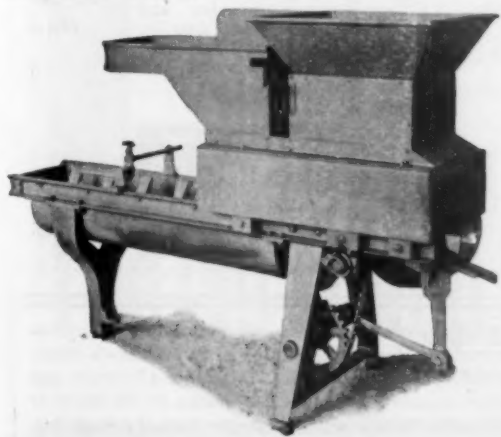
The **STANDARD PORTABLE MIXER AND ENGINE** are mounted on suitable truck, well designed, convenient to operate.

WRITE FOR CATALOGUE AND PRICES.



Hand Power Standard Mixer.

South Bend Machine Mfg. Co.,
807 S. Franklin Street, SOUTH BEND, INDIANA.



The Standard Continuous Concrete Mixer

"The Mixer that Measures and Mixes."
"You fill the Hoppers, the Mixer does the rest"

CONTINUOUS, AUTOMATIC, FEED EXACT PROPORTIONS.

Materials first Dry Mixed, then "Tempered." Output instantly variable from 0 to Maximum at will of operator, thus insuring Fresh Material for each Block. Feeds Sand and Gravel Dry or Wet.

Write for description and prices to

The Standard Machine Co.,
KENT, OHIO



Cement Building Block the Coming Material.

We are Agents for Machines that Make the Blocks.

We are operating one of the largest block plants in the South, and are in position to demonstrate its success—also manufacturers of crushed stone for concrete purposes.

The Amount of Investment Necessary to Make Blocks is Small. . . . Why Not Be the One in Your Town to Take Hold of It?

If you will buy the Machine, it will prove a paying investment.

Write us for particulars, also catalogue.

We cheerfully answer all questions.

Newsom Crushed Stone and Quarry Company,

First National Bank Building, :: NASHVILLE, TENNESSEE

THE PERFECTION POWER BLOCK MACHINE For Making Hollow Concrete Blocks.

The Only Machine Making Hollow Blocks Under High Pressure.

100 TON PRESSURE
ON EVERY BLOCK.

600 TO 1000 BLOCKS
PER DAY.

OUR MACHINE MADE THE SAND-LIME BLOCK ON EXHIBITION AT THE SAND-LIME BRICK CONVENTION, DETROIT.
WRITE US FOR FULL PARTICULARS.

THE PERFECTION BLOCK MACHINE CO., Kasota Building, Minneapolis, Minn.

Tell 'em you saw it in ROCK PRODUCTS.

Cement Plant Location

Near Pittsburgh, Pa.

The undersigned represents a certain party who has a large tract of valuable land near Pittsburgh, Pa., containing abundant raw material for making a high-grade Portland Cement; also both natural gas and coal for fuel. Railroad connections right into property, and low freight rates to Pittsburgh. *One of the best locations for Portland Cement Plant in the United States and in the midst of the greatest industrial center of the world.*

Would like to correspond with parties looking for a location or with some practical cement man with capital who would like to join present owner in organizing a company to build a first class modern plant. I mean business and can make good every claim that I make to the property and its advantages.

Address, WALTER K. HOOD, 421 Wood Street, Pittsburgh, Pa.

W. D. MEYER,

Manufacturer of

Marble White Lime

115 Delaware Street, QUINCY, ILL.

**Peirce
City
White
Lime**



Before placing your order for any of the following articles it will pay you to communicate with the undersigned and secure their prices.

Treads	Urinal Stalls
Risers	Laundry Tubs
Platforms	Sinks
Blackboards	Tiling, etc.

The Penna. Structural Slate Co.,

EASTON, PA.

A line or two
in the Wanted
and For Sale
Department will
bring the de-
sired results.

THE GENUINE

GANDY

PATENTED 1877

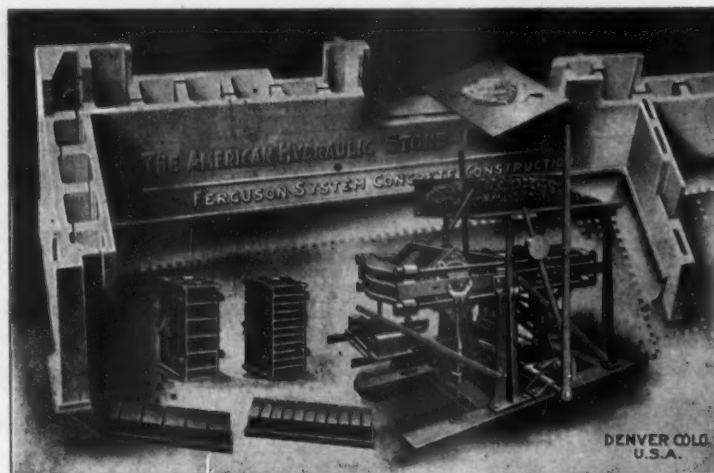
In Quarry Work

—the grit sand and moisture that combine to eat the life out of Rubber and Leather belting seem only to toughen Gandy Belting. In fact, Gandy will last years where Leather and Rubber last months, despite the fact that it costs less than half of leather.

GANDY BELTING CO. BALTIMORE, MD.

Two-Piece Hollow Concrete Wall and Partition containing Header Bond and Continuous Horizontal Air Space. Impervious to Heat, Cold, Moisture and Sound. Fire and Vermin-Proof. Walls of all widths, blocks of all shapes and sizes. New Hand Press enables three men (mixture supplied) to make 1,200 blocks, 10 000 brick or 5,000 paving blocks in 10 hours.

The Walls of a Cottage are the Work of a Single Day.



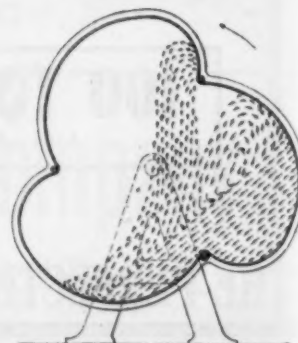
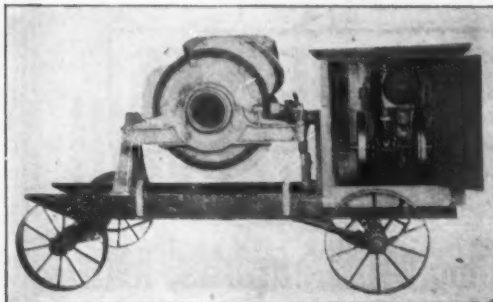
80-Page Catalogue
fully illustrated,
mailed upon
request.

**The
American
Hydraulic
Stone
Company,**

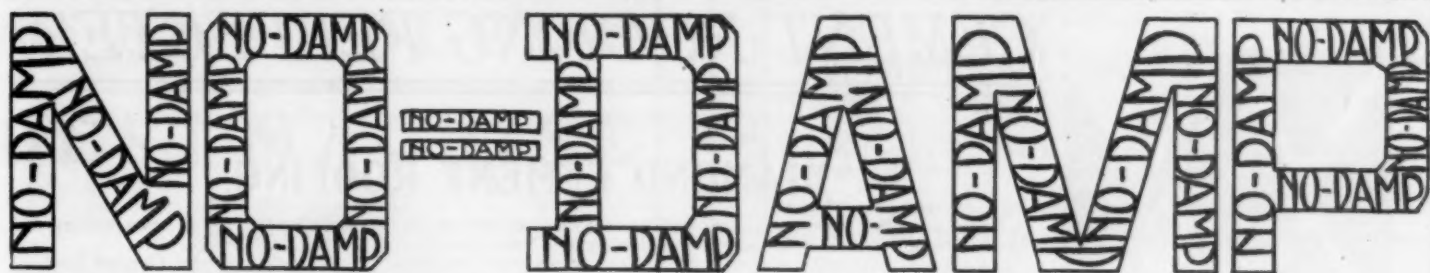
Century Building,

DENVER, COLO.**The "Clover Leaf" Concrete Mixer****HAS NO INSIDE MECHANISM**The material is doubled over NOT ROLLED.**Note the Points:—**

Simple in construction.
Efficient—a mixer that mixes.
Easy to keep clean.
Made in sizes for large and small operators.
We invite inquiries for descriptive catalogue.



Address **THE "CLOVER LEAF" COMPANY, South Bend, Ind.**



No cores, no jarring or pounding, no broken or cracked blocks. A perfect circulation of air passes through the air spaces, making a perfect sanitary structure as well as an absolutely dry one. The wall can be made from two to eight inches thick, making it possible to build a wall any desired thickness. Write us for Catalog B. and we will tell you about the most practical method before the public.

The No-Damp Concrete Block Machine Co.

Northwestern Building, MINNEAPOLIS, MINN.



FACE VERTICAL.

—The— **RUNYAN**

The Latest—The Simplest—The Best

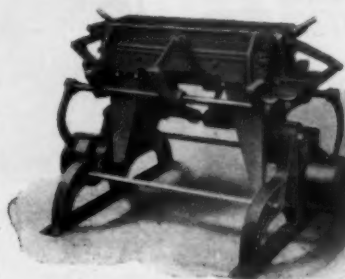
The ONLY successful Mechanical Combination of THREE machines in ONE—Face-Vertical, Face-Down and Brick Machine. All for one price.

Can be converted from a Face-Vertical into a Face-down in ONE minute. It can be changed reversely in the SAME time.



FACE DOWN.

No Advertising Deception But a Genuine Reality



BRICK MACHINE CLOSED.

Can be transformed into a BRICK machine in FIFTEEN minutes.

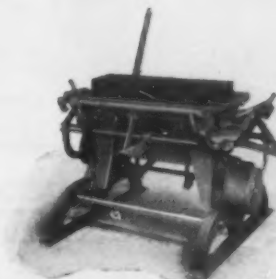
Only one width Straight Pallet necessary on which to make all widths of Blocks, thus saving at least TWO-THIRD of the money spent for Pallets that other machines will require to accomplish the SAME WORK.

We are the original inventors of the Lever-counterweight Combination with all principles involved; our patents are basic; beware of other machines using our mechanism.

For Further Information Address,

The Runyan Concrete Machinery Co.
75-77 Canal Street, CLEVELAND, OHIO.

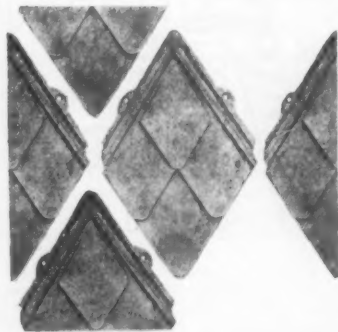
GOOD AGENTS WANTED.



BRICK MACHINE—OPEN.

Tell 'em you saw it in ROCK PRODUCTS.

CEMENT ROOFING PERFECTED!



After the expenditure of many months and many dollars we are now ready to offer to the trade our "Diamond" Cement Roofing Machines for making

"DIAMOND CEMENT ROOFING."

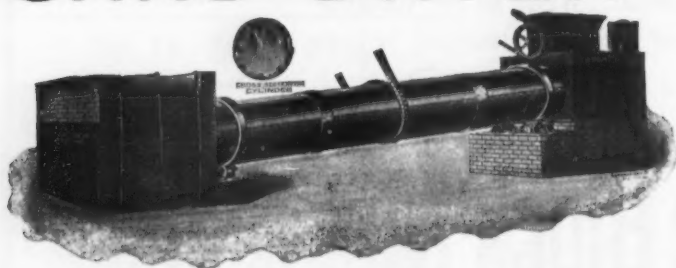
A product which overcomes every possible objection to cement roofing and offers a field at once inviting and profitable, especially for those now engaged in cement construction of any kind

Not all who build will use cement blocks, but nearly every builder is a possible customer for Cement Roofing. Opportunities are unlimited; profits are large. It will pay you well to investigate this business. Let us send you our handsome booklet. It's yours. Just ask for it.

The Diamond Cement Machine Co., Deshler, O.

J. P. STOLTZ & CO., General Eastern Agents, 420 West 23d Street, NEW YORK CITY.

SAND DRYER



Dryers, Screens, Elevating and Conveying Machinery, Mixers, Concrete Building Block Machinery of all kinds, Power Tampers, Etc.

Ask for catalogue and prices.

The Standard Sand and Machine Company,
CLEVELAND, OHIO.



Red, Brown,
Buff and Black
**MORTAR
COLORS**

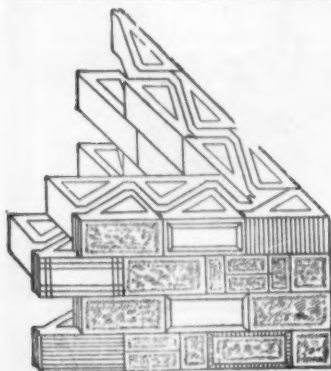


The Strongest and Most Economical in the Market.

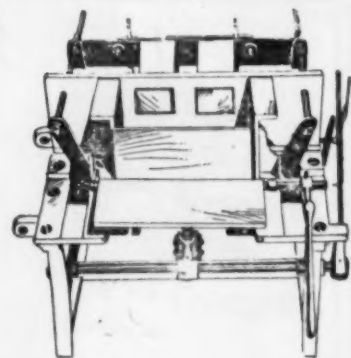
Our Metallic Paints and Mortar Colors are unsurpassed in strength, fineness, and body, durability, covering power and permanency of color. Write for samples and quotations.

CHATTANOOGA PAINT CO., CHATTANOOGA, TENNESSEE.

The "Reed" Machines are in the Lead



Most simple, rapid, up-to-date Machines on the market. Face-down or Face-side Machines producing single, double, hollow or right-angle tri-angle blocks. Best brick machines out. Our system of two-piece wall excels all others on account of the natural bondage and triple air space. Orders received from all sections of the country are filled promptly. When in the market for concrete block or Brick Machine as well as concrete mixer, get our catalogue and prices. Do you desire to make \$\$\$\$\$\$? We can start you right.



The Wichita Coal and Material Co., Wichita, Kan., U. S. A.

High-Grade Concrete Block, Brick, Post, Sill, Cap and Mixing Machinery

"Just remember 9"—"We have the Leaders"—"9 of them"

- 1 Normandin Concrete Block Machine (Face Side).
- 2 Peninsular Concrete Block Machine (Face Down).
- 3 Cemaco Concrete Block Machine (Face Side).
- 4 Champion Concrete Veneer Machine (Face Down).
- 5 Favorite Sand Cement Brick Machine with mechanical tamper.
- 6 Systematic Concrete Mixer.
- 7 Universal Cement Post Machines.
- 8 Practical Sill, Cap, Step, Lintel Mold.
- 9 Superior Ornamental Molds—Baluster, Bases and Balls.

Members of the National Concrete Manufacturers' Association.

CEMENT MACHINERY COMPANY, "Cement Bldg." Jackson, Mich.

Hundreds of Block and Brick plants in operation. The Hollow Block and Brick business is permanent and profitable, broadening in extent every day. It's not a question of material, but is a question of machine.

We are in the business, "first in field, established 1900." We can give you the best value for your money. Write us. Don't delay. Get started. Concrete blocks and brick are in demand. We solicit your trade because we can please you. Our machines are standard; adopted twice by the U. S. Government. Highest awards Universal Exposition, St. Louis, 1904, and Portland Exposition, 1905 for superior excellence.



FAVORITE NO. 1.



NORMANDIN.

Architectural Ornaments

Pleasing Effects Can be
Produced by the Use of Our

BALL AND SPINDLE MOLDS

The cost is light but rich, effective beauty is secured to your work. No plant can be called complete without them. We provide for the necessity that has been holding the cement industry back. Write to

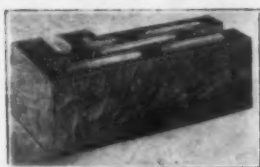
DEVER'S CEMENT WORKS, CASSOPOLIS, MICHIGAN.

Do not wait till others get the equipment, it will pay for itself on one job.



A GOOD PAIR—Dever's Ball and Spindle Molds

The BEST BLOCK IS MADE BY THE BEST MACHINE



ROCK FACE CORNER BLOCK.

THE WARREN CONCRETE BLOCK MACHINE

Makes a Hollow Concrete Block that has triple dead air spaces, the only corner block made that cannot be pierced at any angle without striking a dead air space. A wall laid with these blocks is absolutely water and frost proof.

The Warren Machine is easily and quickly operated, adjustable for making any size block desired and arranged for special facing. A durable machine, practical for large or small plants.

Write for full particulars regarding the several different styles of blocks made by the Warren, all possessing the principles of the double and triple continuous dead air spaces.

ADDRESS

Johnson Concrete Machine Co.
215 MASSACHUSETTS BLOCK, :: SIOUX CITY, IOWA.

THE FLOUR CITY

"Continuous Air Space" Block Machine

HAS NO COMPETITORS, BECAUSE IT MAKES:

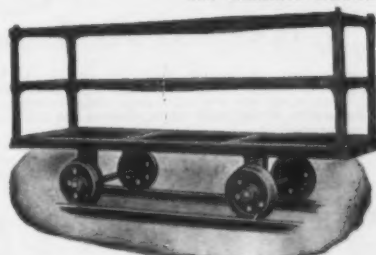
An Absolutely Moisture and Fire-Proof Block.
A Wall with Continuous Vertical and Horizontal Air Chamber.
A Block with Rock Face, Panel Face, Brick Face and Broken Ashler Face.
Any Degree Angle Blocks, Arches, Water Tables and Fancy Cornice.
The Only Block Having Two Nailing Points Moulded in Every Stone

Will turn out 150 to 200 Blocks,
in ten hours with two common men.

Write us to-day for Catalog, Special Proposition, Exclusive Rights, Territory, etc., etc.
AGENTS WANTED.

THE FLOUR CITY CEMENT BLOCK & MACHINE CO.
701 Sykes Block, MINNEAPOLIS, MINN.

Roller Bearing Drying and Transfer Cars for CEMENT BLOCKS and BRICK.



Do not buy a car where the corner braces extend below the beams of the deck as they spoil the end blocks.

The only car that has the center of the decks supported without the annoyance of center legs.

Write us for Catalogue No. 5.

The Chase Fdy. & Mfg. Co.
COLUMBUS, OHIO.

The Dunn Hollow Block Machine



COMPLETE in every detail. Especially adapted to the use of the Block manufacturer. Making blocks in all widths, lengths and many designs, including Sills, Lintels, Pier Blocks, etc.

These Machines Combine the Side Face and Face Down Systems. **Price \$100**

MASONS AND BUILDERS BLOCK MACHINE

MAKES blocks from 2 to 12 inches in width, up to 20 inches long in different designs. No expensive iron pallets required. A practical, rapid and economical machine for the Mason and Builder. No machine at any price makes better blocks or makes them more rapidly or economically. **PRICE \$40**

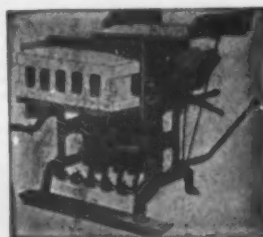
WRITE FOR CATALOGS.

Sole Manufacturers in the U. S.
W. E. DUNN & CO., 350 W. Fullerton Ave. Chicago, Ill.

IT IS A QUESTION OF ECONOMY

in buying a Concrete Building Block Machine the same as any thing else. You want the best, at the same time the cheapest. The SIMPLICITY fills both of these requirements.

Write for catalogue and further information.



"THE SIMPLICITY."

The Standard Sand & Machine Company.

Manufacturers of Labor Saving Machinery.

Address Dept. "D."

CLEVELAND, OHIO.

The American Sandstone Brick Machinery Company.

Dept. R. SAGINAW MICH.

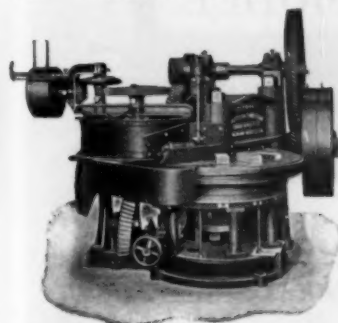
DON'T confuse our practical system with the so-called Scientific Systems. We have the Practical System, the Practical Machinery, the Practical Press, the Practical Hydration and the Practical Outfit, which is manufactured in our own shops, under the supervision of Practical Men with Practical Experience.

Our Plants are installed under the supervision of practical engineers who know how Sand-Lime Brick should be made, and can be made.

We have practical plants running successfully, to show to prospective investors.

We are Not Scientists.

We produce results, because we are the oldest practical Sand-Lime engineering company doing business in the United States, and we defy contradiction. Incorporated April 1902.



Improved Kemnick Rotary Presses are now being built right or left hand, with extra table for making face and fancy brick, on which double pressure is exerted. Our patented rotary brush does the work of one man, and keeps the plunger plates clean.

Hayden Mixers are Thorough

The Hayden Mixer is a composite of durability, rapidity and economy. The materials are automatically fed. The drum is made of No. 8 gauge steel plate, made in two sizes. The reel is a spiral arrangement of steel knives. Send for Catalog "B"

The Hayden Automatic Block Machine Co.
Columbus, Ohio.

New York and Foreign Office:
Hayden Automatic and Equipment Co.
26 Cortlandt St., New York City.



To Procure or to Sell Quick—

Try a line or two in the Wanted and For Sale Department.

Tell 'em you saw it in ROCK PRODUCTS.



RIGHTLY NAMED
—IS THE—
DEMOREST
**Little
Giant
Mixer**

That was the unanimous expression of unbiased opinion at the Chicago Convention—WHY? Let the following speak for itself and remember that the Batch Mixer referred to is one of the best known:

GRAND RAPIDS REFRIGERATOR COMPANY.

Ballou Manufacturing Co., Belding, Mich.

Grand Rapids, Mich., December 19, 1906.

Gentlemen:—We have been using one of your power mixers for the past month and will say that we are greatly pleased with its operation. We are using at the same time an \$800.00 machine with steam power. The latter is a batch mixer, and we notice every time the men get a little lazy, they don't put in as much gravel as they ought to, which increases the necessary portions of cement. We also notice that in the operation of the batch mixer, four or five laborers are frequently waiting for the batch to be mixed, thus much time is lost; while with your mixer we can load up the wheelbarrows as they come around.

We are also much pleased with the thoroughness with which the cement is mixed with the gravel. It is a perfect mixture and the proportion of cement and gravel can be regulated to a nicety. If purchasers only realized that your machine is more exact in proportion of gravel and cement than batch mixers as they are usually worked, we do not see why you should not sell all the machines that are needed. We also find a great economy in the fuel expense, the coal for the batch mixer costing \$1.00 a day, and the gasoline only fifty cents a day. Another economy is in the cost of the engineer. The batch mixer calls for a man at \$2.50 a day to shovel coal and attend the engine. Your mixer requires no such expense. It also takes fewer men to shovel the gravel into the machine because they can work steadily, while with the batch mixer they have to wait until the batch is mixed and emptied every time. We figure the saving in labor and fuel at \$15 per day over the batch mixer, and they are running side by side, and your machine will make more concrete than the batch mixer.

C. H. L.
H. D.

Very truly yours,

GRAND RAPIDS REFRIGERATOR CO.
(By C. H. Leonard.)

Do You want to save that \$15 a day?
If so, write for booklet to

BALLOU MFG. CO. 35 High Street, Belding, Mich.

Hercules Concrete Block Machine

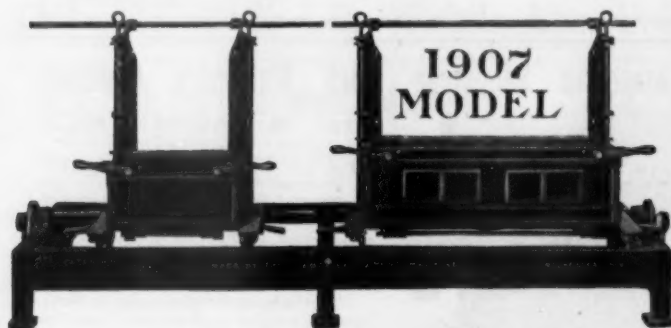


MADE ON THE HERCULES.

Don't think of buying a machine 'till you have seen our beautiful new catalog describing in detail the superiority of the 1907 model Hercules above all other machines.

This catalog which is the most elaborate book of its kind ever printed, is handsomely illustrated with high grade half tones of Factories, Apartment houses, Churches, Dwelling houses, which were built of stone made on the great Hercules.

The 1907 model Hercules is built stronger than ever before, and has several advanced improvements fully described in the new catalog. Write for the catalog to-day. Be sure and ask for catalog.



Century Cement Machine Co.,

179 WEST MAIN STREET,
ROCHESTER, N. Y.

Tell 'em you saw it in ROCK PRODUCTS.

MIXERS



Made in Three Different Sizes.

Simple, labor saving, light and handy to move around. We want to prove to you that we are many years ahead of our competitors. Write for catalog and be convinced.

Write for Catalog 3.

EUREKA MACHINE CO.

420 N. Jackson St.

JACKSON, MICH.

The Latest Improvement in Building Material.

A Product in Itself, No Imitation.

"ART MARBLE," "LITHOLITE"

—and—

Concrete Building Blocks.

THE THOMAS

Block and System of Insulated Walls

—combining—

Strength, Durability and Beauty.

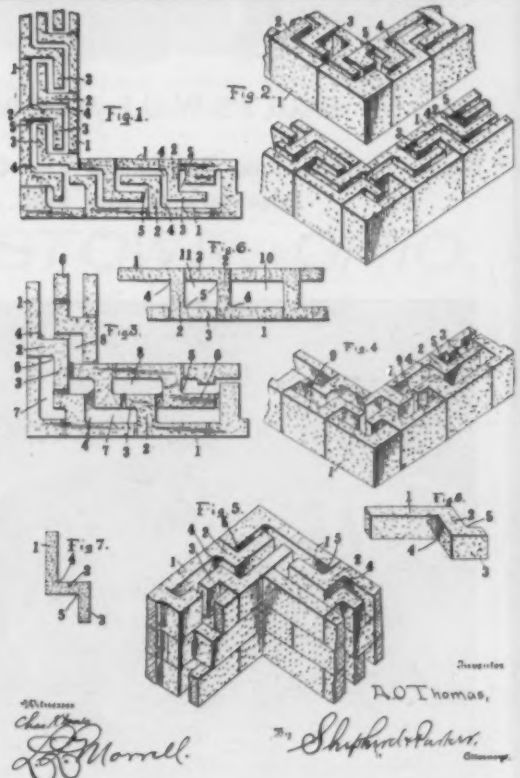
As far superior to common imitation stone as pressed brick is to common, and much cheaper. Our process is based upon scientific principles. Machinery and cost of manufacturing reduced to the minimum.

**BLOCKS NON-ABSORPTIVE
WALLS FROST PROOF**

AGENTS WANTED

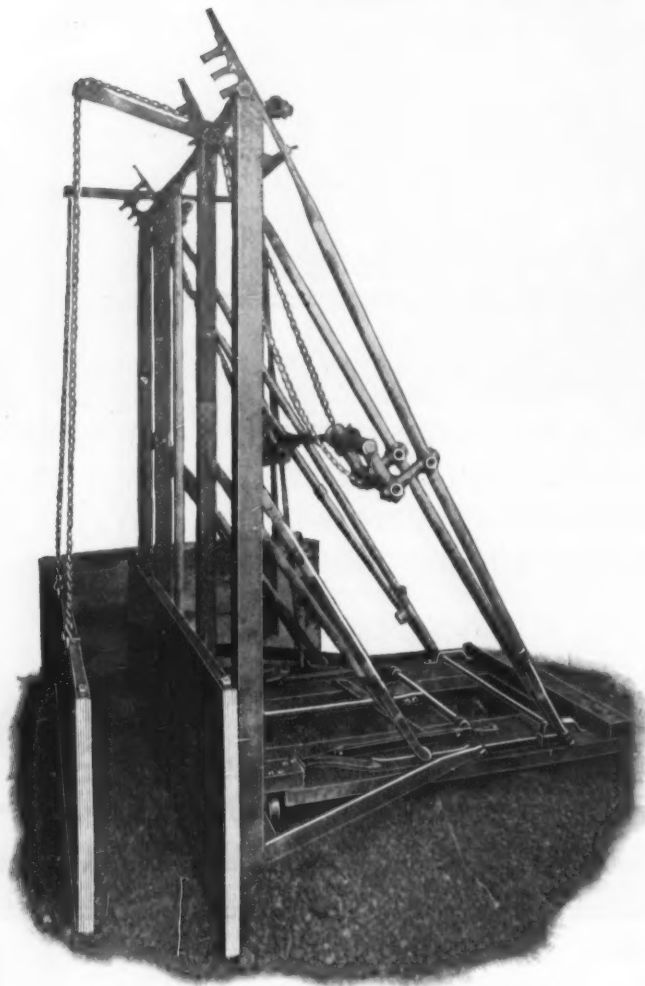
**Buy while Introductory Prices
are Offered.**

Patents fully Cover System.



KNUTZEN & ISDELL, General Agents, Kearney, Neb.

Tell 'em you saw M in ROCK PRODUCTS.



PAULY'S WALL MACHINE

Builds Foundations, Basements and Cellars without falsework of any kind.



FOUNDATION BUILT WITH PAULY WALL MACHINE.

This entire basement and foundation, including partitions or division walls built with one crew of 3 men operating our machine at such a rate of speed and a total bill for materials as to outclass all competition of either stone or brick, besides a big margin of profit for the concrete contractor.

Pauly System

The Only Complete

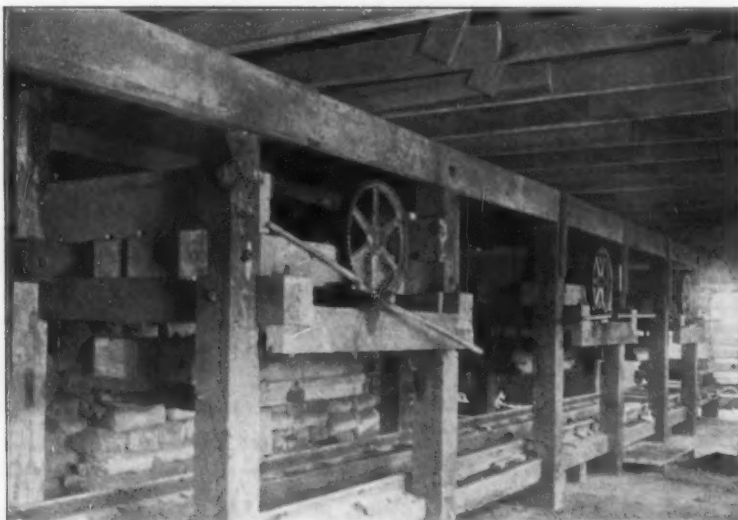
General contractors and heavy construction concerns will find the Pauly Wall Machine for the construction of basements, cellars, foundations, retaining bins, silos and every description of monolithic concrete work, where it is a feature.

The economies of using the Pauly Wall Machine are not theoretical. Any work can be exhibited and the saving clearly shown. Competition is no match.

Pauly's Patented System for the manufacture of hollow concrete blocks is different from others. It is no imitation of any other building material, but original design, method and adapted to the best structural practice and experience. Highly recommended.

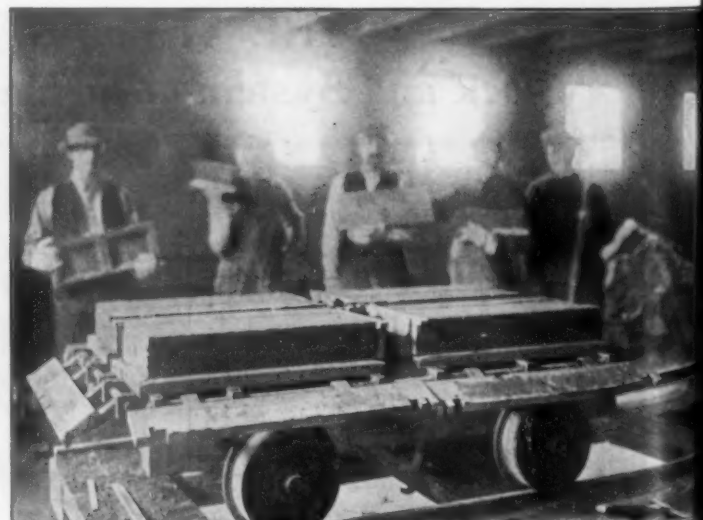
Investigation and action

CONCRETE STONE



THE POWER CONCRETE BLOCK PRESS.

Construction and equipment necessary for manufacturing concrete blocks by Pauly's Patented System on a large scale.



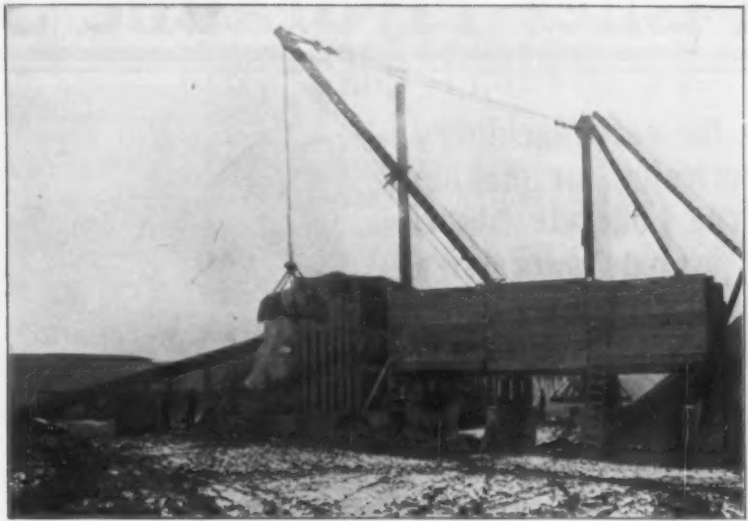
BLOCKS READY FOR STEAMING CARS.

One of the trucks just as it is delivered from the power press before the removal of the completed batch of blocks.



THE SAND BANK.

shovel equipment and cars by which the sand and gravel are delivered to the plant for the manufacture of blocks, or for delivery on the job where basements and foundations are constructed.



WASHING AND GRADING SAND AND GRAVEL.

Complete outfit for the separation of sand and gravel into various commercial sizes and the system provided for washing the same.

Method of Concrete Construction

Only Completed Method Meeting Every Structural Requirement.

will find advantage to employ the
ers, four retaining-walls, storage-
when give cribbing or centreing

ot these Any amount of completed
ition is

w concrete differs entirely from all
t origin, mechanically perfect
Highly recommended by architects and

engineers and popular with the mechanics employed in building. More than two-thirds of the material used by other systems is saved.

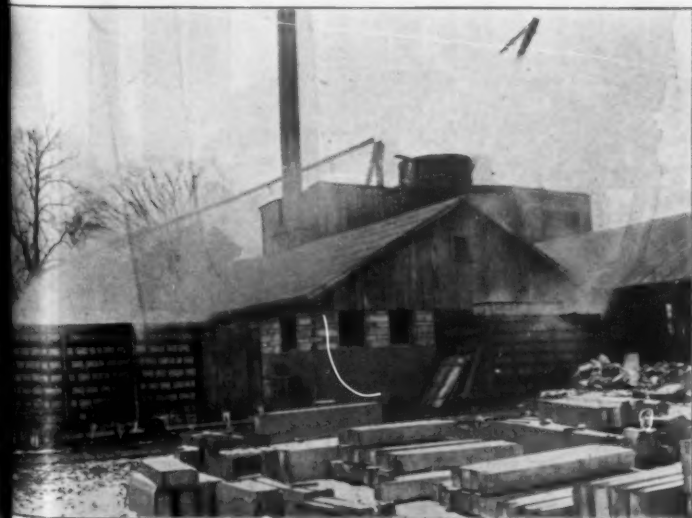
The blocks are made face up, a perfect troweled facing similar to high grade floor work is attained to which pressure is applied with a high geared power-press. The blocks are cured or seasoned by steam and hot water and a finished product in perfect condition is ready for delivery within two days.

The Pauly equipment provides for a complete plant manufacturing concrete building material, where dividends can be computed and earned upon a strictly business basis, as shown in the accompanying illustrations.

tion and action of Fully Equipped Plant in Profitable Operation Invited.

E D SAND CO.,

YOUNGSTOWN, OHIO.



STEAM CURING CARS IN OPERATION.

yard equipment of a plant operating by Pauly's Patented System for the manufacture of concrete blocks and curing by means of Pauly's Patented Steaming Cars.



A FINISHED HOUSE IN SIX DAYS.

Completion of the contract, from the sandbank as shown above and having passed through the various processes shown in the other illustrations, ready for occupancy.

Fisher Hydraulic Stone Machinery

**Is the only Machinery
Perfect for making
True Concrete Stone.**

HYDRAULIC POWER SYSTEM.

A 200 Ton pounding, tamping pressure, uniformly applied.

Condenses the concrete 30%.

Same density from center to surface.

Allows the use of sufficient water to make a plastic mix.

Cement thoroughly crystallized.

These conditions produce true stone of great density and strength.

Stone of all sizes and shapes within dimensions 68x18x9 inches.

ASK FOR CATALOGUE "R"



**Turns out from 1500
to 3000 cubic feet of
stone per day.**

Solves the problem of producing a high grade, reliable building material at moderate cost.

The demand is constantly increasing Lumber will soon be exhausted.

Cut stone is generally too expensive True Concrete Stone will soon be used as extensively for building as it is now used for paving.

By-products of quarries, mines, furnaces, etc., utilized.

INVESTIGATE NOW.

ASK FOR CATALOGUE "R"

Complete operating exhibit at Convention of National Association of Cement Users, Chicago, January 7 to 12, 1907.

Fisher Hydraulic Stone & Machinery Co.

Builders' Exchange Building,

::

BALTIMORE, MARYLAND

The Sensation in Cement Brick

The Peerless Cement Brick Machine is making brick for the new Minneapolis Armory.



All outside walls are made of cement sand brick, which are now being manufactured on the ground by the Peerless Cement Brick Machine.

**Practical
Durable
Economical
Profitable**

One man has made on this machine, over 3,000 perfect brick, in ten hours.

Prices right.

**SEND FOR
CATALOGUE
and PRICE.**



Patent No. 811,518

PEERLESS CEMENT BRICK MACHINE.

Giving you a view after delivering a load. At the top stands the steel facing plate, used only in facing end brick. At the right are tamping mallet, collar and float. On the pallet are ten complete bricks, one showing a rounded corner. Attachments for all forms of ornamental brick furnished extra, and easily adjusted.

Peerless Brick Machine Co.

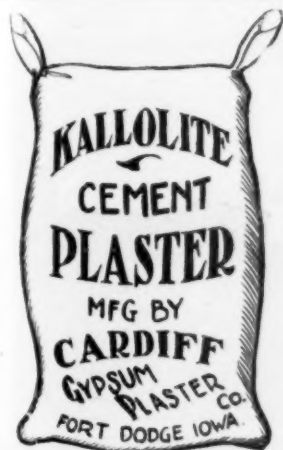
100 "A" Lumber Exchange,

-

-

MINNEAPOLIS, MINNESOTA

Tell 'em you saw it in ROCK PRODUCTS.



KALLOLITE CEMENT PLASTER

IS MANUFACTURED FROM THE PUREST GYPSUM ROCK FOUND IN THE UNITED STATES AS SHOWN BY GOVERNMENT REPORT.

CARDIFF GYPSUM PLASTER CO. MANUFACTURERS FORT DODGE, IOWA

Plaster! Plaster!

IOWA HARD PLASTER CO.



HARD BY NAME
HARD BY NATURE
HARD TO BEAT
NOT HARD TO GET



IOWA HARD PLASTER CO., Ft Dodge, Iowa.

Empire Gypsum Company

The Empire Gypsum Company's new mill, with capacity of 200 tons daily, is in operation and we are prepared to promptly furnish the best quality of Empire Stucco, Empire Neat Plaster, Sterling Wood Fiber Wall Plaster and Excelsior Wall Plaster.

Garbutt, Monroe County, New York.



McKelvey Batch Mixer

Does not dump under drum and frame. Note the long discharge spout. Its object and advantages explained in new booklet, ask for it. Once used no other is good enough. All sizes.

McKELVEY CONCRETE MACHINERY CO., 171 La Salle St., Chicago, 1215 Filbert St., Phila. Pa.

Simplicity } in **THE X-L CONCRETE STONE MACHINE** is { Efficient
Practicability } { Economical

A Tested Success from Results of Years of Experience.

Guaranteed to Equal in Efficiency any Four Other Machines and Save 20 to 25 per cent. in the Construction of "Dry Walls."

A New Feature—Interchangeable Plates. The same plates can be used on all sides, finishing both the face and outside and inside returns, and can be inverted and intermingled, forming hundreds of different designs and combinations. Our blocks make all width walls, and form all parts of a building, the same as a brick.

Bear in Mind you don't require five or six different size machines to do the work when using our X-L Machine. It makes blocks in 17 different lengths, 3-4 1/2-6 and 9 inch heights; angles and circles, for both full walls and veneering, giving a variety of over 1000 blocks; all made on the one size pallets.

Dry Wall Guaranteed without facing the blocks, or using face solutions, which are not only troublesome and expensive, but destroys the beauty and natural stone appearance. 10 to 25 per cent saved in material without sacrificing strength. Our Off-Bearing Car and Automatic Loading and Unloading Truck has changed the back-breaking work under the old methods to almost child's play, saving 75 per cent in the cost of handling blocks. **We Back Every Statement We Make.**

See Catalog For
Prices.

E. E. EVANS, Mgr.

111-113 W. 18th Street,
Kansas City, Mo.



PETTYJOHN CONCRETE BLOCK MACHINE.

THE CHOICE OF THE PRACTICAL
5,000 IN SUCCESSFUL USE

The only machine with which it is possible not to disturb the concrete after it is moulded or while it is setting. Operated on the Pettyjohn system—"Move the Machine, Not the Block." Detachable and interchangeable face plates. Positively guaranteed to be the most labor-saving, simplest, best, fastest and cheapest machine on the market, regardless of price. No carrying of blocks, no expensive iron pallets, no cogs, gears, springs, levers or broken blocks. Sand, water, and cement only materials required. One man can operate. Made in various sizes. Every machine fully guaranteed and we ship on trial, and there are no strings to our trial offering—you alone are the judge of the machine in your own shop. Beautiful catalogue and other information free.



THE PETTYJOHN CO., 614 No. Sixth St., Terre Haute, Ind.

Buy a HAYDEN for STRENGTH as well as RESULTS

The Hayden Automatic and Adjustable Block Machine is the only one on the market strong enough to withstand the heavy strain of pneumatic tamping. Write for booklet of what practical men say on the subject.

Points of Superiority:

Strength. Down Face.
Rapidly. Limitless Range.
Ease of Operation.
Simplicity of Construction

HAYDEN, the standard of excellence. Send for catalog to-day.



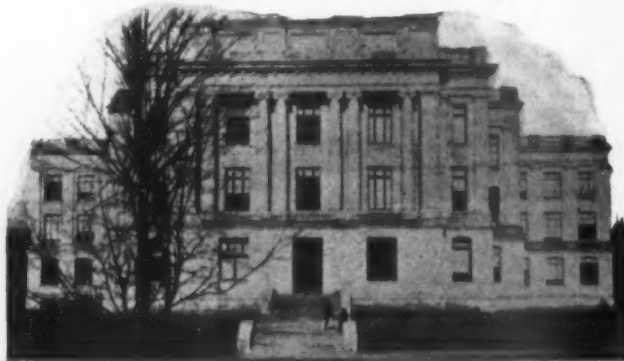
THE Hayden Automatic Block Machine Co.
Box 705, COLUMBUS, O. 112 W. Broad St.
New York and Foreign Offices:
HAYDEN AUTOMATIC & EQUIPMENT CO.
26 Cortlandt St. NEW YORK.
WESTERN OFFICE: 415 Real Estate Building
821 Chestnut St. ST. LOUIS, MO.

Tell 'em you saw it in ROCK PRODUCTS.

RESIDENCE OF CHARLES F. ROOD,
GRAND RAPIDS, MICH.



CHEMISTRY BUILDING, UNIVERSITY OF WISCONSIN,
MADISON, WIS.



RESIDENCE OF CHAS. W. WRIGHT,
GRAND RAPIDS, MICH.



These buildings were made better: your building can be made better by using

SACKETT PLASTER BOARD INSTEAD OF LATH

Sackett Plaster Board is a building material that should command the attention of every man who is interested in good building construction. It is displacing wood and metal lath in edifices of every type, and has earned the unqualified commendation of architects and builders everywhere. Every architect owes it to his clients, every owner owes it to himself, to investigate this material before making old-style specifications.

Sackett Plaster Board has succeeded, and is succeeding, because it is something more than a mere base to hang plaster on—it offers advantages and gives results that are not obtainable in any other way. It makes a warmer wall than wood lath, is cheaper than metal and resists fire far better than either.

The New Way.



Sackett Plaster Board

is not merely a substitute for lath. It can be used to good advantage somewhere in every building that is put up.

Sackett Plaster Board is an excellent fire retardant and sound deadener and can be used between floors to excellent advantage. It has also been used a great deal for sheathing, and those who have tried it are enthusiastic over the results. Tar paper used in ordinary sheathing usually cracks when the heat is turned on. Sackett's Plaster Board gives a warm, tight wall, and costs 25 to 50 per cent less than lumber and paper.

When used in interior work the plaster is put on with half the usual amount of water, which not only saves time (often an important consideration) through quicker drying, but reduces the warping and shrinking of timbers and trim. The finished wall is hard and firm, can be depend-

ed upon not to warp or crack, and the ceilings are not subject to the streaks caused by porosity of the "clinchers" as in ordinary lathing.

In warehouses and commercial plants the fireproof and insulating properties of Sackett Plaster Board can be utilized in many ways—between floors, as a covering for exposed metal surfaces, and as a non-conductor in the casings of kilns and refrigerating plants.

The State Insane Asylum at Binghamton, The Marlboro Hotel at Asbury Park, The Savoy Theatre, New York, the United States Naval Academy at Annapolis, are types of buildings in which it has been used successfully and economically.

Results Considered. Sackett Plaster Board is the cheapest building material ever made. And its first cost, in many cases, is no more than is paid for antiquated, inflammable and unsatisfactory lathing.

This advertisement, necessarily, gives but a suggestion concerning Sackett Plaster Board, printed in the hope that it will interest those who contemplate building. If you are interested, and would like to know all about it, without obligation,

Drop a line today to any of the following distributors.

The Old Way



UNITED STATES GYPSUM COMPANY,
CLEVELAND, CHICAGO, FT. DODGE

GRAND RAPIDS PLASTER COMPANY,
GRAND RAPIDS, MICHIGAN

SACKETT PLASTER BOARD COMPANY,
17 BATTERY PLACE, NEW YORK CITY

Tell 'em you saw it in ROCK PRODUCTS

SOMETHING NEW!

A plaster finish without lime!

And without the troubles of lime!

As different from lime as
marble is from chalk!

A Plaster Product as Big
as the Market is Wide!

A Market as Wide as
the Need is Great!

AND THAT IS

“UNIVERSAL”

Made only by

UNITED STATES GYPSUM CO.

CHICAGO

CLEVELAND

FT. DODGE

The Only Fire-Proof Sand for Cement Brick and Blocks

THE BEST SAND THE IDEAL SAND FOR SAND-LIME BRICK PURE WHITE AND BUFF
 GLASS MANUFACTURING FOUNDRY PURPOSES 99% Pure Silica THE BEST OF KNOWN
 GLASS BEVELING STONE CUTTING CORE SANDS.
 PLASTERING AND CONCRETE
 KENTUCKY SILICA COMPANY, LOUISVILLE, KY. MINES ON I. C. R. R. AT
 TIP TOP, KENTUCKY.

WHEELING WALL PLASTER CO.,

MANUFACTURERS AND JOBBERS

Wheeling Plaster and Builders Supplies.

WHEELING, - - WEST VIRGINIA.



DRYERS

OF EVERY TYPE
 CONSTRUCTED FOR ALL PURPOSES.

AGENTS FOR BISHOP WATER JACKETED FURNACE FRONTS
 UNITED STATES DRYING ENGINEERING CO.
 66-70 BEAVER ST., NEW YORK, U.S.A.

SPECIAL MACHINERY AND FORMULAS

FOR THE MANUFACTURE OF

WOOD FIBER PLASTER, FIRE PROOF-
 ING AND KINDRED PRODUCTS.

We furnish the latest improved FIBER MACHINE, (fully patented),
 also FORMULAS, on a reasonable proposition. The strongest compa-
 nies and oldest manufacturers are operating under my contracts.
 WRITE FOR TERRITORY.

The Ohio Fiber Machinery Co. J. W. VOGLESONG, GENERAL MANAGER. Elyria, Ohio.

KING'S WINDSOR CEMENT FOR PLASTERING WALLS AND CEILINGS

Elastic in its nature, can be applied with 25 per cent. less labor and
 has 12½ per cent. more covering capacity than any other
 similar material.

Buffalo Branch: CHAS. C. CALKINS, Manager
 322 W. Genesee Street

J. B. KING & CO., No. 1 Broadway, New York

METAL LATH

Bostwick Expanded Metal BOSTWICK FIRE-PROOF STEEL LATH

For Plaster Walls and Ceilings, Concrete Re-
 enforcement. Our Flat Lath the Stiffest and
 Most Economical Metal Lath on the Market.
 WRITE FOR SAMPLES AND PRICES.

BOSTWICK STEEL LATH CO.,
 NILES, OHIO.

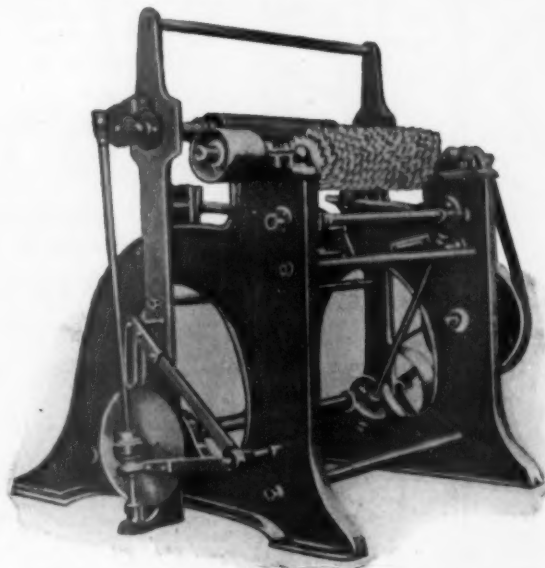
Blue Rapids Gypsum Co.'s Mill

will start September 1st. Capacity two hundred
 tons daily. They have an eight-foot vein of Gyp-
 sum and will be ready to fill all orders quickly,
 as they have the best equipped mill in the country.

—ADDRESS—

Blue Rapids Gypsum Co.
 BLUE RAPIDS, KANSAS.

"The Cochran" Automatic Wood Fibre Machine (PATENTS PENDING)



There is positively nothing cheap or shoddy about this machine, either in workmanship or
 material.

There are no Sprocket Wheels or Chains, no Cone Pulleys or Cog Wheels to break, get out of
 order and cause trouble. All the power is transmitted with bevel gears adjusted to "run like a
 watch."

We call special attention to the "speed increasing mechanism" and automatic action of our
 machine. When the log is reduced to the size of 2 inches the carriage is automatically released,
 and swings back to place without being touched by the operator, while at the same time the log
 stops revolving, without interfering with the other parts of the machine.

The log when finished is revolving six times as fast as at the start and all done automatically
 and continuously.

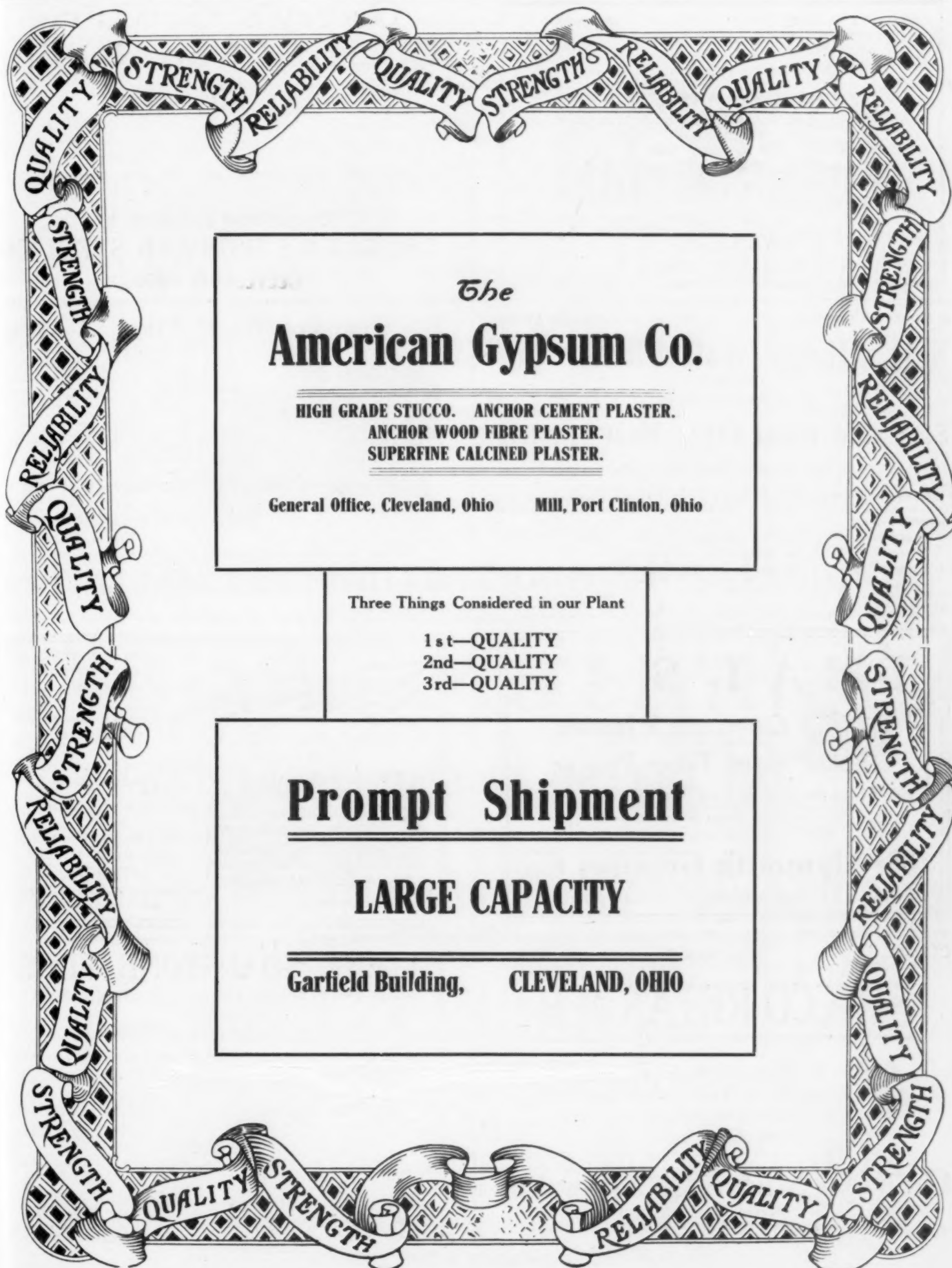
Write for catalogue and prices to

Concrete Engineering and Equipment Co.

Butler, Pa.

Greensboro, N. C.

Tell 'em you saw it in ROCK PRODUCTS.



The
American Gypsum Co.

HIGH GRADE STUCCO. ANCHOR CEMENT PLASTER.
ANCHOR WOOD FIBRE PLASTER.
SUPERFINE CALCINED PLASTER.

General Office, Cleveland, Ohio Mill, Port Clinton, Ohio

Three Things Considered in our Plant

- 1st—QUALITY
- 2nd—QUALITY
- 3rd—QUALITY

Prompt Shipment

LARGE CAPACITY

Garfield Building, CLEVELAND, OHIO

HIGHEST AWARD
ST. LOUIS EXPOSITION
1904.

RED, BROWN,
BUFF, PURPLE,
BLACK

For Brick, Mortar, Cement, Stone, etc.

The RICKETSON MINERAL COLORS
COLOR
QUESTION SETTLED

FOR QUALITY AND STRENGTH
WE LEAD.

RICKETSON MINERAL PAINT WORKS, Milwaukee, Wis.

H. L. Graf, Pres. E. T. Silder, Vice-Pres. & Gen'l Mgr. Osborne G. Reilly, Sec. & Treas.

New Albany Wall Plaster Co.

(Incorporated.)

MANUFACTURERS OF

Star and Wood Fiber Wall Plaster.

NEW ALBANY, IND.

We wish to announce to the trade that we are now running and at the present time, are in position to fill all orders promptly. Those who have used our goods claim it is the finest they ever had.

If you have not tried it, we are sure it would be to your interest to do so.

Prices always right and your orders solicited.

NEW ALBANY WALL PLASTER CO.,

NEW ALBANY, IND.

Cumberland Phone 408.
Home Phone 137.

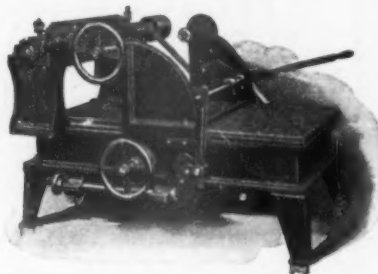
Garry's Genuine Charcoal Iron Roofing

WILL NOT RUST

If properly cared for. Roofs put on forty
and fifty years ago are now good.

Manufactured Exclusively by
THE GARRY IRON AND STEEL CO.
CLEVELAND, OHIO.

The Leonard Wood Fiber Machine



Has an Automatic, Proportional, Increasing Feed, which keeps grade of fiber uniform from start to finish, and holds machine to highest possible rate of production for the grade of fiber and number of saws. Does not begin with fiber and end with dust, nor fall off in rate of production on each log, from 40 to 80 per cent as do the ordinary non-increasing feed machines. Works logs up to 24x24 inches. No royalty string attached to sale. Pay no attention to misrepresentations of our competitors but write for descriptive circular and terms to

The Shuart-Fuller Mfg. Co.

Successors to

The Elyria Machine Works,
Elyria, Ohio

ELYRIA MACHINE WORKS, Elyria, Ohio

Gentlemen:—We are very much pleased with your machine, as is evidenced by the fact that we are ordering the second one from you. This last machine will take the place of a machine, which we have found takes more power to run, with about one-third the output of your machine.

Yours truly,
S. A. WALKER, Vice Pres.
Acme Cement Plaster Co., St. Louis, Mo.

THAT'S IT



Cement Plaster
Wood Fiber Plaster

The Brand that's Made from Pure Gypsum Rock.

Correspondence Solicited.

MANUFACTURED BY

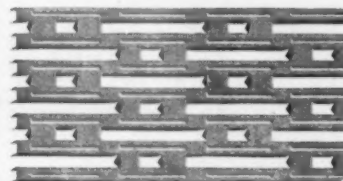
The Plymouth Gypsum Co.

FORT DODGE, IOWA



TRUSS LATH.

THE AMERICAN ROLLING MILL CO.
MIDDLETOWN, OHIO.



CLINCHER LATH.

**SOLID PARTITIONS
ERECTED WITHOUT
STEEL STIFFENING RODS**
are
ABSOLUTELY FIRE-PROOF
TRUSS LATH
is
**BEST FOR STUCCO WORK,
LIGHT FLOOR SLABS, ETC.**

**CLINCHER LATH
LEADS
AS A PLASTER SAVER.**
**SMALL KEY—LEVEL
SURFACE.**

Strong, Rigid, Durable.
Write for Samples.

OLDEST.

STRONGEST.

BEST.

STUCCO RETARDER

Our new Air Separation Plant gives us some
of the finest ground and most uniform
Retarder made, with strength equal to any.
Let us submit sample, and prove it.

Chemical Stucco Retarder Co.

Incorporated 1895.

WEBSTER CITY, IOWA

PATENT SOAPSTONE FINISH

PLAIN AND IN COLORS FOR WALLS AND CEILINGS.

Patent Soapstone Mortar.

Prepared in any Color for Laying Pressed and Enamelled Brick,
Stone Fronts, Terra Cotta, Chimneys, Fire Places, Etc.

The Dodge Blackboard Material or Artificial Slate.

The Potter Blackboard Material.

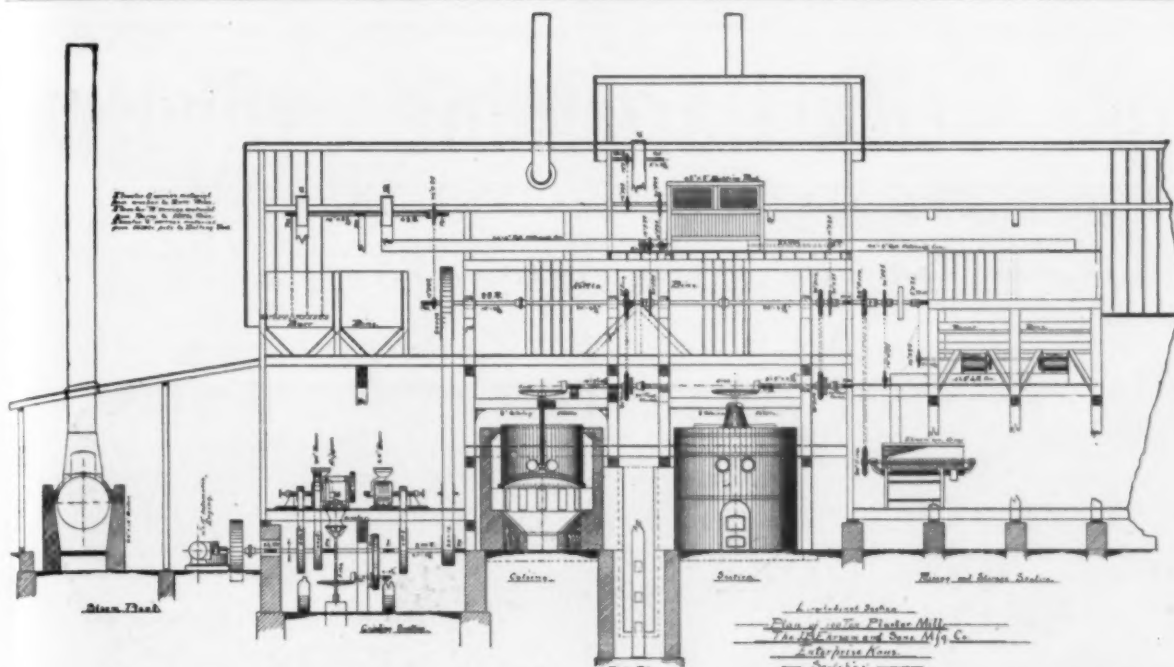
SOAPSTONE MICA. CONCRETE DRESSING.
CRUSHED, GROUND AND BOLTED SOAPSTONE.

AMERICAN SOAPSTONE FINISH CO.

S. P. DODGE, Proprietor.

CHESTER DEPOT, VT.

Tell 'em you saw it in ROCK PRODUCTS



WE MANUFACTURE

Calcining Kettles
Jaw Crushers
Rotary Crushers
Bolting Reels
Shaking Screens
Turkey Emery Rock
Burr Mills
Plaster Mixers
Hair-Pickers
Conveying, Elevat-
ing and Power
Transmitting
Machinery.

We are prepared to submit plans and estimates for the complete equipment of wall plaster mills, and furnish all machinery required of our own manufacture and design. **Special Machinery to meet special requirements.** Twenty years experience in building and equipping Wall Plaster Mills. New Catalogue in press. Write for a copy. Address

The J. B. Ehram & Sons Mfg. Company
ENTERPRISE, KANSAS.

Gypsum Machinery

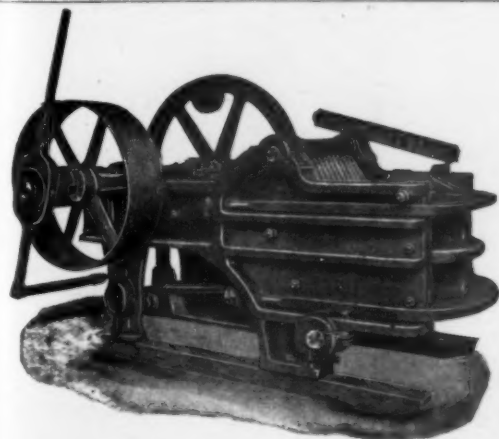
A fine and complete line of Modern Machinery.

KETTLES, CRUSHERS, NIPPERS, ETC.

We are now building the new Plymouth Mill at Fort Dodge, Iowa, the finest mill in the United States.

ASK FOR CATALOGUE.

Des Moines Manufacturing and Supply Company
DES MOINES, IOWA.



CRUSHERS

for soft rocks, burnt lime, etc.

GYPSUM MACHINERY.

We design modern Plaster Mills and make all necessary Machinery, including Kettles, Nippers, Crackers, Buhrs, Screens, Elevators, Shafting etc.

SPECIAL CRUSHER-GRINDERS FOR LIME HYDRATORS.

BUTTERWORTH & LOWE

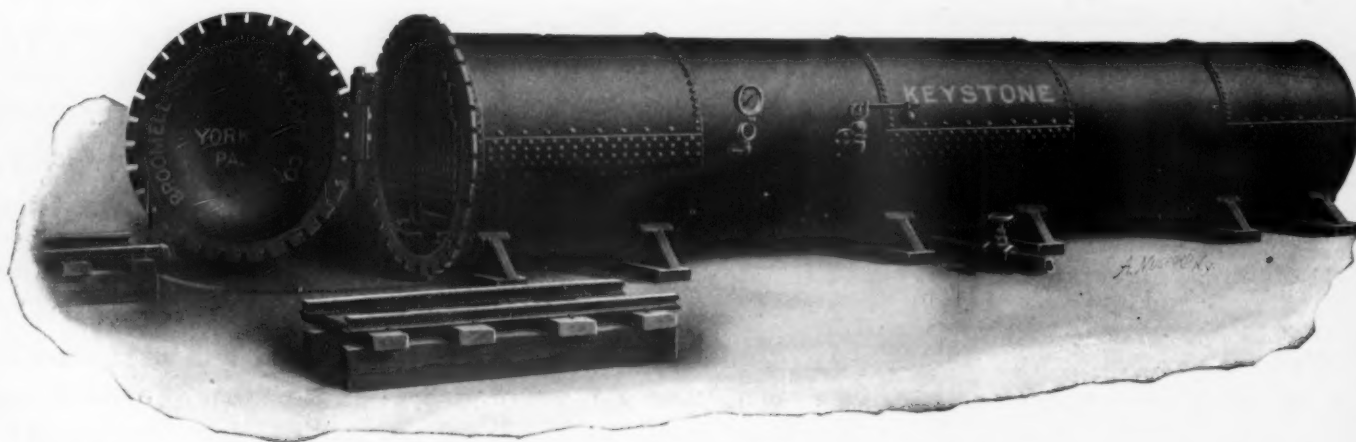
17 Huron Street, GRAND RAPIDS, MICH.



Sand-Lime Brick Hardening Cylinders

BINS, ELEVATORS, CARS, HYDRATING MACHINES.

SPECIAL WORK OF ANY KIND BUILT FROM BLUE PRINTS.



BROOMELL, SCHMIDT & STEACY CO., YORK, PA.

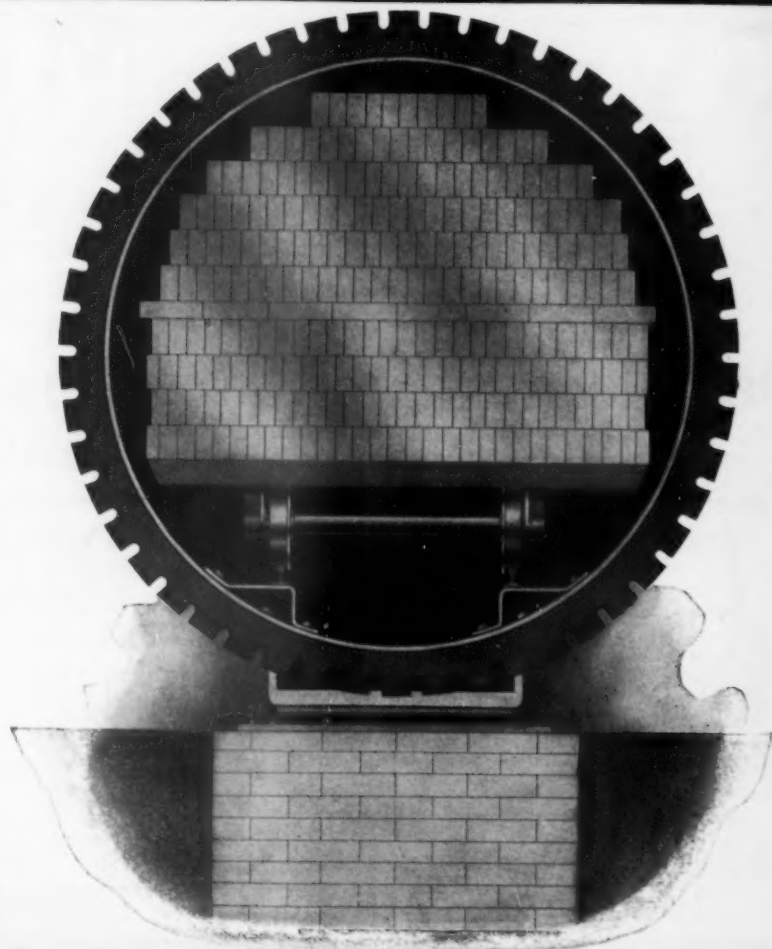
Sand-Lime Brick Machinery

Our Sand-Lime Brick Machinery is at least a little better than any other. We have testimonials to show it. We build it all in our own factory and are sure of its quality. We are the only firm doing this. We will design and equip your entire plant or will sell you parts of your equipment. Our catalog describing and illustrating our full line will be sent upon request.

We also build a full line of machinery and appliances for making Clay Products, Cement and Pottery, Dryers and Dryer Apparatus.

Everything we sell we make. We therefore know its quality to be right.

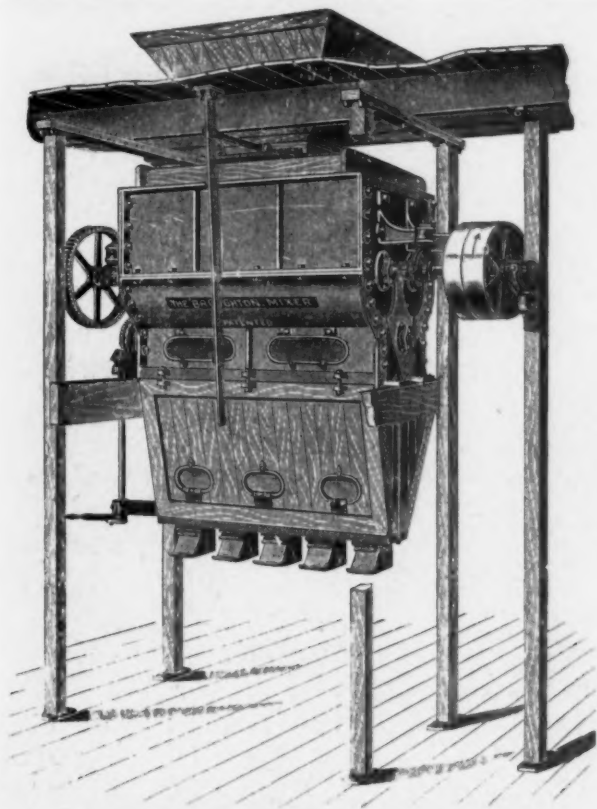
—The—
American Clay Machinery Co.,
WILLOUGHBY, OHIO, - - - U. S. A.



Tell 'em you saw it in ROCK PRODUCTS.





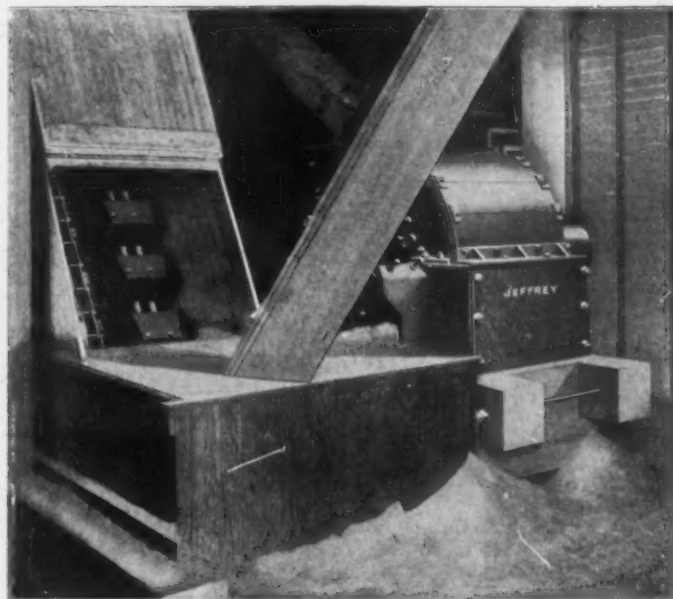


The most thorough and efficient
Mixers of Plaster, Cement and
Dry Materials. Send for Circular.

W. D. DUNNING, Water St., Syracuse, N. Y.

Jeffrey Machinery

Crushing and Elevating Limestone



At Plant of Carthage Superior Limestone Co.

Send for free catalogs on

Elevating, Conveying, Screening, Crushing, Power-Transmitting Machinery.

The Jeffrey Mfg. Co., Columbus, Ohio, U. S. A.

New York Chicago Pittsburgh Boston St. Louis Denver Montreal, Canada.



SAND- LIME BRICK

We have had more experience in
equipping, starting and operating SAND-
LIME BRICK PLANTS than any other
concern in this country, and we make
STRONGER GUARANTEES.

ALL MONEY REFUNDED if brick made in regular work are not equal to samples submitted. No risks
and no expensive experimenting under our method of installing plants. It is the **only safe method** for
beginners in any new industry. Our latest illustrated Booklet gives full particulars. Sent free.

Send for new book on "Users of Sand-Lime Brick," just issued.

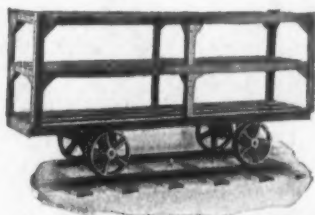
American Sand-Lime Brick Co.,

1306 Great Northern Building, CHICAGO.

We Build Cars



For Quarries, Mines, Cement Works, and General Use. Also Dumping Buckets, Stone Carriers or Skips, Wheels and Axles.



SWITCHES,
FROGS,
RAIL,
TURNABLES.



The Atlas Car & Mfg. Co.
CLEVELAND, OHIO.

"Giant" Portland Cement

has been used by the foremost engineers, architects, contractors and builders for the past 20 years in the most difficult and important construction ever undertaken in this country, and has been found to be under all conditions

Strong, Sound, Permanent.

"IMPROVED UNION" ROSENDALE

at long periods shows results equal to the average of Portlands.

"The Test of Time" tells the story. Write for it.

AMERICAN CEMENT CO.

Manufacturers.

Lesley & Trinkle Co.,
General Sales Agents
N. W. Cor. 15th & Chestnut Sts.
PHILADELPHIA.

United Building Material Co.
320 Broadway, 101 Milk St.
NEW YORK. BOSTON, MASS.

THE STANDARD AMERICAN BRAND

Atlas Portland Cement

ALWAYS UNIFORM

The best cement for both large and small work.
Easy to handle and eminently satisfactory.

The Atlas Portland Cement Company 30 Broad Street
NEW YORK, N. Y.

Ask for our book—"Concrete Construction about the Home and on the Farm."